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GRADUATE

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GENERATIONS OF ENTHUSIASM

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ANNUAL REPORT**

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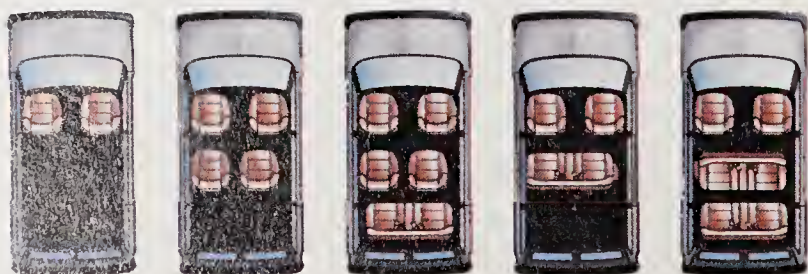
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GRADUATE



GENERATIONS OF ENTHUSIASM

By Judith Knelman. Older students bring life experience to class. Page 5.

PASSING THROUGH

By Bradley K. May. A stroll across campus brought a sense of place. Page 9.

HELPING PEOPLE TO REMEMBER

By Pat Donohue. Researchers haven't forgotten about memory! Page 12.

PHARAOHS' BOASTS PUT TO TEST

By Arthur Kaptainis. The makings of a reproducible experiment. Page 16.

PRESIDENT'S PAGE

By George Connell. The colleges and the university. Page 19.

THE BENEFITS OF NUCLEAR ENERGY

By O.J.C. Runnalls. An appreciation of peaceful uses. Page 22.

ALUMNI NEWS

By Mary Martin. Our astronaut knows about motion sickness! Page 28.

VARSIITY FUND

Annual report for 1984. Page 34.

CAMPUS NEWS

Page 32.

GRADUATE TEST NO. 31

By Chris Johnson. Page 42.

LETTERS

Page 26.

AFTERMATH

By Ed Barbeau. Page 42.

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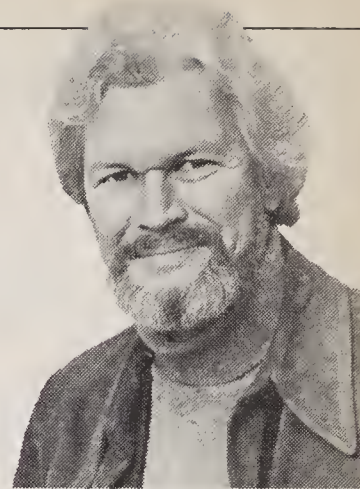
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CAREER QUESTIONS OF IMPORTANCE



THE CAREER COUNSELLING AND PLACEMENT CENTRE attracts as many as 20,000 students in a year, young people who may need part time, summer or permanent jobs. The students are given access to lists of opportunities but there is a good deal of counselling done as well. And it is here that Rivi Frankle, the centre's director, has been stymied because she simply doesn't know the answers. The information requested on the card included with this issue of *The Graduate* is urgently needed, and is based on their questions.

You can help.

What Frankle wants to know is something about career paths that alumni have followed, so that she and her staff can pass relevant information on to the students. Problems strike virtually every discipline and faculty, but the perennial question is the value of a B.A. Since it is assumed that graduates will often start with a minor position, Frankle wants to test her hypothesis that such lowly positions do, in fact, lead to challenging careers. And *how* this comes about.

"There are a lot of employers out there," says Frankle, "who want certain qualities at the entry level, an M.B.A., for example. It's become a sort of password. But there are also many employers who think that a B.A. is valid in itself, proving an ability to learn, to organize, to conduct research."

No one has ever, to her knowledge, conducted a wide, long-range survey to determine what has happened to people who have been off campus for 10, 15, 20 years or more, and who can explain how their university education helped them, and whether they are still making use of it, directly or indirectly.

There are two sections to the survey card. The first is simply a list of questions about how you started your working life, how your career developed, and what sort of education you were equipped with. From this Frankle will be able to extrapolate information which will help to guide new graduates toward productive and interesting careers. She will learn, for example, whether a 1950s engineering graduate is still working in the field, or is in management, or has changed careers and is doing something quite different. Or whether a history student is teaching history or is in business.

The second part of the questionnaire has to do with one of the most valuable services the centre offers: the network of people in many fields who are willing to spend an hour with a student who is wondering about following a particular career path. "We have a file of people in various occupations," says Frankle, "who will tell students about their careers, how they got to where they are, what is required."

That's the part of the questionnaire that asks for your name and address, and isn't essential to the information-gathering section. Anyone who would be willing to meet students occasionally, will be warmly welcomed.

*

Ed Barbeau, author of the maddening *Aftermath* column regularly found on the back page of this magazine, has generated so much correspondence as a result of the column that he has had to resort to publishing a newsletter to cope. This is in addition to meticulously answering each letter he receives from readers. Letters to and from a mathematician are intriguing to say the least, generally providing a combination of humour with at least one page consisting of nothing but equations and symbols. The amount of effort that some readers invest in *Aftermath* is quite incredible.

Two issues of the newsletter have been mailed so far and circulation has risen to 60. Barbeau comments on the responses, acknowledges correct solutions, and generally gossips about some of the more inventive solutions most entertainingly. "So far," he writes in the first issue, "the chocolate cake problem has been by far the most popular, causing some readers almost frantic frustration." Also included was an eight page bibliography: *Mathematics for the Amateur*. Other items are mini-reviews of mathematical puzzle and paradox books. An impressive little publication.

None of which would surprise anyone who knows him. If he hasn't been busy enough as associate chairman of the Department of Mathematics (a post he retires from this summer) he manages to fill his time one way or another. He was a church organist for several years, served four years as one of the coaches for the Canadian team in the International Mathematical Olympiad (which has taken him to Washington, Budapest, Paris and Prague), and is currently president of the Canadian Society for History and Philosophy of Mathematics.

Barbeau is a tall, lanky fellow with a quick smile and an almost boyish enthusiasm for his field. If I'd encountered a teacher like him at some point I imagine I'd be able to fill out my own income tax form!

Anyone interested in receiving "After *Aftermath*" is invited to write to *Aftermath*, c/o *The Graduate*, Department of Communications, University of Toronto, Toronto M5S 1A1.

A handwritten signature in dark ink, appearing to read "John Aitken". The signature is fluid and stylized, with a long horizontal line extending to the right.

John Aitken, Editor

GENERATIONS OF ENTHUSIASM

BY JUDITH KNELMAN



OUR OLDER STUDENTS BRING LIFE EXPERIENCE
TO CLASS. YOUNGER STUDENTS LIKE THAT.

THEY CONSTITUTE BUT A SMALL PROPORTION OF U of T's population, these earnest, enthusiastic, white-haired students, who are making their presence felt on the campus in an extraordinary way. They move more slowly than their classmates, but they have more to say: they've been there. What is in the future for most students is in the past for them, not dead and buried but vivid and relevant.

In a political science course, a man of 77, a retired management consultant who has followed politics for years, has no trouble producing instances and names to illuminate the theory that is being discussed. The other students, who he says regard him as a person of incredible antiquity, are fascinated. And he in turn finds it exciting to be in touch with the next generation of political decision-makers.

In a history course, a man who is old enough to have fled Russia at the time of the revolution speaks up when he encounters professors he considers leftist. He has come to Canada from Europe because in his experience accepting the state as the great provider means also allowing it to decide your fate. His dialogue with the professors bridges the gap for the students between history and reality.

In an English course, an outspoken woman who has been writing poems for 50 years takes issue with T.S. Eliot's theory of poetry. As she expresses her view that a poet should not keep his personality out of his work, younger students who have grown up on modern poetry influenced by Eliot get an idea of the framework, the context, in which Eliot was working.

"The major contribution of older people in my classes," says Joseph Shatzmiller, a professor of medieval history, "is the fact that they convey the idea that at any age you can study something. Their presence shows that history is interesting and important. They take good free time of their own to study it when they have nothing material to gain. It shows that you don't study because it's the

thing to do between 18 and 24 but because the subject is important. They lend support to the whole operation we have here."

"It does change the nature of the class," says Michael Dixon, who teaches English at New College. "There's an advantage in some cases to the presence of someone who's got experience that none of the students can have. It adds a dimension that just wouldn't be there."

He cites the case of an older student in his Shakespeare class who had had experience in producing musical presentations. Her paper on the economics of theatrical production made the idea concrete and gave the others a perspective they wouldn't have had without her.

"I've always been glad to have older people in my classes," says Dixon. "They usually are there because they are exceptional. Ordinary people of that age wouldn't go to the trouble of getting to class in the snow and rain and doing all the work."

Some who try to be extraordinary are held back by the physical limitations of being old. David Nimmo, director of student services for Woodsworth College, which runs the credit program for students over 65 in the Faculty of Arts and Science, says their grades are comparable to the younger students', but the withdrawal rate is higher. Some find it too hard to get around in the winter; others go south to avoid it entirely. Sometimes the problem of short-term memory loss manifests itself in the middle to late seventies, making it difficult for students to proceed with courses they'd planned to take. Then, too, there is the plain fact of mortality. "Quite frankly, at the pace they go at, some of them won't finish," says Nimmo. So Woodsworth awards certificates of merit every June to seniors who have achieved at least a 60 per cent average in six courses.

Part of Nimmo's job is to accommodate the program to the students' needs. One woman takes a course each year at times that fit the schedule of the person that



Louise Thompson comes in from Oakville, usually by GO train and subway

drives her down, a professor here. Other students are in wheelchairs and need classes in accessible locations. Occasionally an upstairs class will be moved to make it possible for someone with a heart condition to attend. Sometimes an instructor is asked to use a microphone to assist the hard of hearing.

The program started at U of T in 1975 under a financial arrangement worked out between the provincial government and the universities. All fees and requirements are waived for seniors taking arts and science courses. So far, about 25 have graduated. About 200 people between the ages of 65 and 95 are enrolled this year.

"It costs the government money," says Nimmo, "but it saves money too. As people get less mentally alert chances are they're going to need some form of institutionalization. The longer they are mentally alert, the longer they can stay in the community."

He thinks the University benefits, too, from the age mix the program brings to their classes. Students get the benefit of their older classmates' wider perspectives and life experiences. And, best of all, stereotypes get exploded.

Dorothy Sone, a student at the Ontario Institute for Studies in Education, who is doing her doctoral thesis on

the Woodsworth College program for senior citizens, interviewed those who had graduated and found them lively, exciting and interesting. "They're a new breed — not like the typical senior citizen people think of."

"I'm a bit of a professional now at retiring," says Frederick Ludlam, an information resources manager with the Ontario government from the time he retired from the air force until he retired again two years ago. Relaxed because he is no longer job-hunting — "I'm not looking for trophies" — he picks out courses that will unify the knowledge he already has, "to try and get a formal framework in which to place all the other reading I've done." He stretches himself in an imagined competition against an established standard. "There's no way I'm going to loaf through this experience and just attend the lectures," he says.

Ludlam has a shining example in his mother, Gladys Jennings, the oldest graduate the University has ever had. She got her B.A. in 1978 at the age of 82.

Louise Thompson has been taking courses since 1977. Like Ludlam — and most of the others in the senior program — she had not been to university before. Enthusiastic, outgoing and active, she hasn't let heart trouble stop her: though sometimes she has trouble walking, at least once a week she comes in all the way from Oakville,



*Frederick Ludlam
isn't looking for
trophies, but he
isn't loafing either*

usually by GO train and subway, to study. She tries to take one course in winter and one in summer and has just completed her thirteenth, which leaves two to go. But to her the B.A. is not the important part of the experience.

"I've been very happy here. I've made a lot of friends, and I have lots of things to think about. I'm not bored. The achieving part of it doesn't really matter — it's all such an inspiration to me." Clearly, part of the attraction is the company of young people. "Once, about six or seven of us had a dinner at one of the girls' places. I took the roast beef. We had a very good time that night, and I'm not going to tell you what we talked about," she says playfully.

It would be wrong to say that Gabe Blackman treats his career at university like a job, though he's on campus by 8:30 every morning and stays all day. "A job is something you do because you have to," says Blackman. "This I do because I want to."

He is filling in a gap left by the Depression, when he didn't have the money to go to university, and World War II, when he was otherwise occupied. By the time the war was over, he was married and in a hurry to establish himself.

Before he retired from his typesetting business a couple of years ago, Blackman had been taking evening

and, occasionally, summer courses. Now he takes two courses during the day. He will probably get his B.A. next year and then go on taking courses. By that time, his wife, Pearl, will have retired and switched from evening to day courses.

He loves his new life. "The University makes us feel so welcome," he says. "And the fact that I am accepted by the students is a delight. I didn't expect it to be that way."

Shane Altschul has been in the program since 1980. He has a degree from the London School of Economics, but that was for another purpose. "The first time around I was very keen on getting insight into economic matters. My goal was to get the degree. Now I'm trying to keep my brain active. I'm not ready to tend a rose garden or take up knitting." He is delving into the very early history of mankind, "probably as an escape from the present times". He does one or two courses a year simply because he finds it stimulating.

Frances Beatty spent 35 years raising a family in Parry Sound. Five years ago she moved to Toronto and got a job. "I knew I had to keep busy. I just wasn't interested in getting up in the morning and wondering who I'd meet for lunch." The job didn't have enough stimulation for her, so she enrolled in the Woodsworth program.



*Frances Beatty
found St. George
Street a far cry
from her memories
from the '30s*

"I feel that this is the last third of my life," she says. "It can be great, as long as I make the right choices. I'm a curious person — curious about my own capacity and curious about the world in general. I wanted to find out what the university scene was all about and whether I could do it or not. I'd spent my life nurturing others. For these few years I wanted to try to develop myself." She's invited her children to her graduation in 1999.

"It's a different world that I've stepped into — but fascinating. I'd never used a Xerox machine or a micro-catalogue. I couldn't believe the red tape of the libraries, and I felt timid about even going into a class. It was a culture shock."

Her first sight of the food wagons on St. George remains with her. "That was my introduction to junk food." It was a far cry from the St. George Street that she remembers from the 1930s. "I was on the sidelines, but my friends and family went to U of T and I was involved in the social things. The street was filled with frat houses then where we used to go to tea dances after football games.

"We had a much more social time than the youngsters do now," she says wistfully. "There was much more mixing. People used to have more fun."

For older people who are not up to a regular schedule of lectures and assignments, there are other learning modes at U of T. The School of Continuing Studies gives those over 65 many courses at half price. It also organizes the Toronto portion of Elderhostel, a one-week residential program for people over 60. The Public and Community Relations Office offers Later Life Learning, a series of 12 lectures for \$15. The Senior Alumni Association runs Canadian Perspectives, lectures by U of T professors; a series of nine last fall cost \$21.

The current crop of senior citizens had to go through the Depression and the war to get to 1985, but now that they're here they're reaping the reward of one of their greatest contributions: the post-war baby boom. It is their middle-aged offspring whose taxes finance government schemes to enrich old age. But, as these people aren't having children at the same rate, it's entirely possible that those of us in the next batch of senior citizens won't be as lucky in our old age.

"Now is the time to be 65," says Sierra Shiffman, coordinator of liberal studies at the School of Continuing Studies. "By the time we're that age, there won't be any money for this sort of thing. It'll be our kids who'll have to support it, and we're not having kids." ■

PASSING THROUGH

BY BRADLEY K. MAY

A STROLL ACROSS CAMPUS WHICH BROUGHT A SENSE OF PLACE

A YEAR AGO, I TOOK A STROLL ACROSS CAMPUS. ONLY recently have I come to appreciate how it acted to root my university activities, and focus my view of the present. After two years of geography graduate work at the University of Toronto, I found myself reflecting upon why I had chosen the academic setting I had, what had been accomplished there, and how I was ready, physically and mentally, for the rigours of life beyond academia. Until then, I had been fully engrossed in departmental prerequisites and an entirely different social sphere.

Geography, by its very definition, is much more than weather forecasts, coloured maps in the Oxford School Atlas and incredibly difficult Trivial Pursuit questions. As a science, it seeks to explain, through careful observation, the physical and cultural processes which act, over time, to alter our environment. I had read several years ago in one of my undergraduate courses that the geographer Pierce Lewis described the cultural landscape as "... our unwitting autobiography, and all our cultural warts and blemishes, our ordinary day-to-day qualities, are there for anybody who knows how to look for them."

Often, when we are replanted into a new environment, it takes an unspecified period to develop an affinity for our surroundings — a sense of place, an appreciation of

the spatial and temporal aspects of our envelope of everyday life.

Having left the South Borden Building one morning in mid-March, I was briskly traversing the campus. It was almost noon, and I had some business to attend to at Bay and Charles. The weather was a typical late winter melange. Grey mottled skies and intermingling snow and rain hurried me on my way.

I slowly felt my thoughts turn from thesis deadlines, defences and obligations, to the sights all around me. I began to take notice of the structural aspects of this institution at which I had spent the past two busy years. My pace slackened as I observed my surroundings, despite the nippiness of the March wind. I tightened my scarf around my neck.

Perhaps the most striking attribute of the University, for one who previously viewed it as merely an administrative umbrella, is its landscape, which reflects both static tradition and unbridled change, however misleading both may be. The significance of this had never before been brought to my attention.

Passing the McLennan Physical Laboratories and the Forestry Building, I noted the difference between quantum theory and silviculture. I wondered what sorts of minds were attracted to each of these distinctive branches of science. I thought of the role played by community structure in scientific development. Buildings and walls exist to compartmentalize academic endeavour, it seemed to me.

Having crossed St. George Street, I chuckled as

Bradley K. May is a graduate of Wilfred Laurier University (B.A. 1982) and University of Toronto (M.A. 1984).



PHOTOGRAPHY BY RUTH KAPLAN

boyhood images of knights and dragons leapt into my head. Names and imagery, often trivial, are indelibly stamped on the cultural landscape, shaping our present.

I went along past engineering in the Galbraith Building and found myself on King's College Circle. Where was this college, which I had heard first incorporated the interests of arts, medicine, law and divinity? It seemed a shadow of a place on this dreary, misty day, yet it existed nevertheless.

There before me was Convocation Hall. In a few short weeks, I too would be one of the many graduates to have filed through its doors since 1904. It had been built, I was told, through the toil and donations of dedicated alumni. Eighty years of keen, expectant youthfulness.

Almost hidden behind it was the stodgiest building on the front campus — Simcoe Hall. I remember watching the distinctive figure of James Ham plying its halls. There is a different head now, tackling the same items on the agenda. It seems there is always some force tugging at the quality of university life, which must be squarely faced. All administrators and disciplines are called on to facilitate.

Thinking about such antagonistic problems, I reminisced about the first time I had heard about my townsman from St. Mary's, Ontario — Professor William Dale. It was before James Reaney and his play *The Dismissal*. A lecturer in Latin, Dale spoke out in 1895 for what he viewed as injustice at a time when the University administration and the Province of Ontario seemed oblivious to the input of junior faculty members and the student body. Administrators and legislators had favoured nepotism over fair hiring practices. Dale's letter to an editor of a Toronto newspaper led to his dismissal. The University draws such temperaments into its fold. This is inevitable, I suppose, given its manifold interests. Backgrounds, values and outlooks interact in unpredictable ways.

Striding professors, harried students and knots of conversation passed on every side of me. Embarking on a shorter crossing of the front campus, I was barred. The muddy playing field, with slippery ice and puddles, was

impassable and so I was steered around its perimeter. I pondered on the activity which must have occurred there on many occasions.

On a new tack, I walked past Knox College. Leaded glass and gargoyles caught my eye. There were an assortment of faces adorning the college's east wall, expressing naiveté, sagacity, absurdity. Some handsome, some grotesque, their countenances prodded, taunted, cajoled and guided me along. Above the massive door was an open book with the inscription, "The Word of the Lord Endureth Forever". All were part of the building's structural signature.

I stared up at the grey northern sky and beheld a darker cloud than the rest. The Robarts Library, perched on the back of the Sir Daniel Wilson dining hall like a squat, half-loaded dromedary, dominated the view. Its overshadowing served as a reminder of pressing needs and priorities.

To my left stood University College — a curious grammatical conundrum. I had always felt this impressive hub of the campus seemed lop-sided, with its single turret rising from a corner of the parapet on the main tower, and Croft Chapter House, an awkward appendage on the west side. Its placement was purely functional, to keep the pungent aromas of chemistry away from the rest of the student body. Across the way were Sigmund Samuel's legacy and the Medical Sciences Building, post-war additions to the circle. The Legislature of Ontario peered over their rooftops, into the commons below.

Leaving this all behind, I walked towards Queen's Park. I passed Hart House, the Massey Foundation's gift to Toronto's academic tradition. As outlined in its Founder's Prayer, Hart House still acts to enhance education through fellowship, debate, conversation,

An affinity for our surroundings — a sense of place, an appreciation of the spatial and temporal aspects of our envelope of everyday life



music, art, sports and drama.

In the background was a memorial to another generation of students, Soldiers' Tower, a passageway, as it were, from the outside. There too, in the foreground, was the Louis B. Stewart Observatory, capped with political graffiti: "Socialists Are Here" and "Commie Power". The relationship of these slogans to the historical development of surveying, geodesy and practical astronomy is only fathomable when you know its tenants — the Students' Administrative Council.

I skirted the Louisbourg guns, which protect the eastern flank of the campus. The archaeologist in me cringed at this new site, situation and context for the displaced objects.

The cars were busily whizzing along the crescent as I tried to venture into the park. I picked and dodged my way across. The wind tugged at my briefcase, but I kept on my course. Slim black squirrels and puffy pigeons were chasing each other for bits of bread and debris from the previous fall. The most tenacious squirrels seemed to have the upper hand.

I walked on, past Edward VII. He seemed anxious for some important pastime. To the north, a series of overlapping waves rolled — Flavelle House and Falconer Hall at the bottom, the white dome of the Planetarium, its cohort the Royal Ontario Museum, and topmost, the Park Plaza and Four Seasons Hotels. They bounded my view to the north. I sped towards the eastern edge of the park.

Safely on the other side, I entered the grounds of Victoria University.

"Another university," I pondered, "so close to my own?"

Unable to reconcile this, I passed the E.J. Pratt Library and Northrop Frye Hall. Through one of the Burwash Hall passageways, I emerged onto Charles Street, and hurried towards Bay. My traverse was finally complete.

Several months later, it was spring and another ceremony was at hand. I, and others, mingled expectantly, and were marshalled in the West Hall of Univer-

sity College. Informed of graduation procedures, we were soon whisked on our way.

As I strode out of the college's front portals, number 162 in the line-up, the June sun glistened off the C.N. Tower beyond the foot of King's College Road. We snaked in a long thin line toward it. There before me, in one winding queue, were my classmates of 1984, stretched to the entrance of Convocation Hall. This group, attired in black, was in sharp contrast to a fresh green lawn and a cloudless blue sky.

Inside, we sat quietly sweating, waiting for the confirmation of the Chancellor. I finally felt a part of this institution, more so than I ever had before. My thoughts returned to the earlier walk across the campus.

To be sure, the route I had followed was one of many possible that I might have taken. This is true in a physical sense, but perhaps not in the sense of perspective I derived from the stroll. One's feeling of belonging in one's surroundings is entirely a personal construction.

A university is an association of separate entities brought together for a common purpose. The University of Toronto has been seen as a good example of federation for the advantage of all. Whether this is rightly or wrongly deserved can be debated. However, it is also a collection of individuals, formulating or working to achieve personal goals. The University is a federation in this respect, whether I or others realized it when we were there. We all bring our perspectives, resources, views and biases into this broader milieu.

One must never lose the concept of where one's place is in this enthralling alliance, either spatially, temporally or spiritually. Some time after my convocation, I came across the appropriate motto of the University of Toronto — "As a tree with the passage of time".

A tree takes sustenance from its environment, grows, changes its shape, sheds its leaves and renews its appearance with the seasons. The cultural landscape of the campus will also evolve. The geography will be altered, added to and taken away from. Nevertheless, we will still be able to say, with the passage of time — *Velut Arbor Aevo*. ■



HELPING PEOPLE TO REMEMBER

BY PATRICK DONOHUE

RESEARCHERS HAVEN'T FORGOTTEN THE IMPORTANCE OF MEMORY

IT HAPPENS TO EVERYONE. YOU'VE JUST MET SOMEONE and you can't remember the new person's name. You wonder whether you have a memory problem. Don't worry. That's what the experts call normal forgetting. But consider the plight of the person who not only doesn't remember the name of someone introduced a moment ago but doesn't remember the meeting or anything else that happened during the day.

That's the kind of serious memory problem that comes under close scrutiny at the Unit for Memory Disorders in the U of T's Department of Psychology. Established by a special research program grant from the Connaught Fund in 1981, the unit has turned up some fascinating insights into the problems of people with impaired memories. At the same time, the unit, along with other centres for memory research on campus, continues to shed light on the normal functioning of that most mysterious of the mind's processes.

"We're trying to raise public consciousness of how important memory is," says Professor Endel Tulving, an experimental psychologist and principal investigator of the unit. Tulving and co-principal investigators Professors Morris Moscovitch (neuropsychology) and Donald McLachlan (neurology), believe society pays too little attention to memory problems. Currently, a person who may be suffering from memory impairment has nowhere to turn for diagnosis or help. "The family doctor or the out-patient department of a hospital wouldn't be able to help," says Tulving. "Our society hasn't thought it relevant to create a way of assessing people's memories." Yet, if standard memory tests were available, the ramifications could be profound. "If we could find some treatment for Alzheimer's disease, then early detection would be very important and one of the first signs is memory impairment," says Tulving.

Possibly, memory problems attract little public attention because they're invisible. "The patient often doesn't show the problem physically," says Dan Schacter who is responsible for day-to-day operation of the unit. "The patient may appear very normal, engaging, sociable and witty. You wouldn't notice the problem until there was a reference to a very recent event — such as something just mentioned in conversation. The patient would behave as if completely unaware of it."

Although memory impairment may not be obvious to others, it's extremely debilitating to the patient. "It has an impact on every aspect of every-day life," Schacter

points out. "If you can't rely on your memory, you're going to be crippled in ways you couldn't imagine." Even your ability to think about the future may be hampered. Tulving cites the case of a patient who experienced just "blankness" when asked to think about tomorrow. The patient told Tulving: "It's like being in a room with nothing there and having a guy tell you to go find a chair, and there's nothing there."

Bizarre as they may seem, the number of such cases is increasing. Given medical advances of recent years, more and more people with severe head injuries survive accidents. They're often left with serious memory problems. And it's estimated that five to ten per cent of the population over 65 years of age could contract Alzheimer's disease. "Memory impairment is something that could affect any member of the community," says Schacter.

The unit, which combines both a theoretical attempt to understand memory better and a practical effort to alleviate memory problems, is breaking new ground. "Most research centres separate the theoretical and applied aspects," says Schacter. "We think it's important to keep both in mind and pursue them on both tracks." The project's length also distinguishes it from others. "Most amnesic research previously had been cross-sectional, studying patients thoroughly at a given point in time but not over a long period of time," explains Tulving. "The way we conceptualized this study — to follow them for several years — was unique and very expensive by standards of psychology research."

The mention of amnesia popularly conjurs up the notion of a fictional character who wakes up after a severe shock (emotional or physical) and can't remember any of his or her past. Although the Unit for Memory Disorders has studied some such cases, most patients involved with the unit suffer from a kind of amnesia caused by one of three physical events: a head injury, the onset of Alzheimer's disease or a ruptured aneurysm of the anterior communicating artery (a small blood vessel in the frontal portion of the brain). Called organic anterograde amnesia, this type interferes mainly with the ability to remember on-going events but patients may have some difficulty remembering specific details of their personal histories.

Formerly, popular belief held that memory could be improved with exercise as a muscle can. Forcing a patient to memorize lists was thought to resuscitate a failing memory. Studies have shown, however, that while subjects in such experiments may learn to memorize longer lists, there is no carry-over to any other

Patrick Donohue is a freelance Toronto writer.



PHOTOGRAPHY BY MICHAEL RAFELSON

ENDEL TULVING: RAISING CONSCIOUSNESS OF THE IMPORTANCE OF MEMORY

memory function. "Memory doesn't get any better generally as a result of exercise," says Schacter.

Instead of trying to repair damaged memories, the unit works on alleviating the problems of daily living. To this end, the unit explores the potential of computers as aids to failing memory. But researchers emphasize that the computer is not used to restore failing memories to normal levels. Betty Glisky, research associate in the unit who designed the computer programs, explains: "The computer acts as a prosthetic device. As you can have an artificial limb, you can have an artificial memory. With the help of a computer, patients can have access to

a wealth of information they don't otherwise have because their own storage areas are no longer working quite right."

Of some 130 patients screened, about 40 have been accepted into one of the continuing programs at the unit. In spite of their tremendous memory impairment, they retain remarkable learning abilities which specially designed computer programs tap. Some patients learn to operate the computers yet retain no memory of the learning process. Tulving describes one patient who has progressed through several training sessions on the computer. "But when he comes back from lunch and is con-

fronted with the computer again, he maintains he has never been near a computer!"

To make such use of a computer, amnesic people need to learn some basic terms and operations. "If they couldn't clear off one message and in-put another one, the computer wouldn't be much use to them," Glisky points out. So her programs introduce patients to some computer terminology, commands and procedures such as writing simple programs and storage and retrieval of information. The lessons use what Glisky and colleagues have dubbed the "vanishing cues" method. Based on the concept of B.F. Skinner's teaching machines designed in the 1950s, the lessons enable students to get hints about the correct answer by pressing the return key. That sounds easy to a person with normal memory but Glisky describes one patient's difficulty: "He knew he had to do something to get a hint but it took him a long time to remember that he had to press the return key."

The computer gives Glisky a complete print-out of each patient's session, showing how many hints were required and how many guesses made. Working at the unit for two-hour sessions twice a week, patients keep trying a lesson until they can do it with only one or two hints. To Glisky's amazement, patients have completed five lessons and she has had to develop more. "Initially I thought there was just no way they would progress this far," she says. One man started the second lesson needing 83 hints. "I thought he had reached his limit but he got it down to two hints after 55 times through the lesson."

Positive reinforcement partially explains the success of the patients. "They enjoy it because they can do it," Glisky points out. "They are used to not being able to remember, not being able to learn. But they get a hint and say, 'oh yeah, I can do that'."

Eventually, these programs may have applications to the working world. "Knowing what a job might involve, we might be able to train an amnesic person to do it by means of cueing so that the person could do it alone," says Glisky. But Schacter warns that such applications are far from certain. One major hurdle is the rigidity of the amnesic person's learning. "Normal people acquire bits of information and put them together to solve problems," says Schacter. "For amnesic people it is not easy to transfer knowledge from one area to another."

But Schacter cites other ways a computer might help an amnesic person. A beeping wristwatch instructed by a home computer could provide an amnesic person with many daily messages of a few words each. "Amnesic people are notorious for not checking notes," Schacter says. A computer could also help with a domestic procedure like baking cookies. Without the computer as a constant reminder, the amnesic person would probably lose track of the process. "This kind of complex memory task is very difficult for them to do on their own," Schacter says.

But what about people who don't fit the description of amnesic but feel they have memory problems? "A lot of people think they have problems but in testing don't turn out to have a problem," Schacter points out. "Depression, personality disorders and psychological stress may affect memory as a by-product but the memory mechanisms themselves may be unimpaired." He also notes

that sometimes a person who is depressed or ageing may "over-interpret" normal forgetting.

Ageing, does, however, present some problems in terms of memory function. "It's not a myth, there are changes in memory with age," says Professor Fergus Craik, whose lab at Erindale College conducts many studies on the effects of ageing on memory. Craik emphasizes, though, that "the changes are much more evident in some kinds of memory than others."

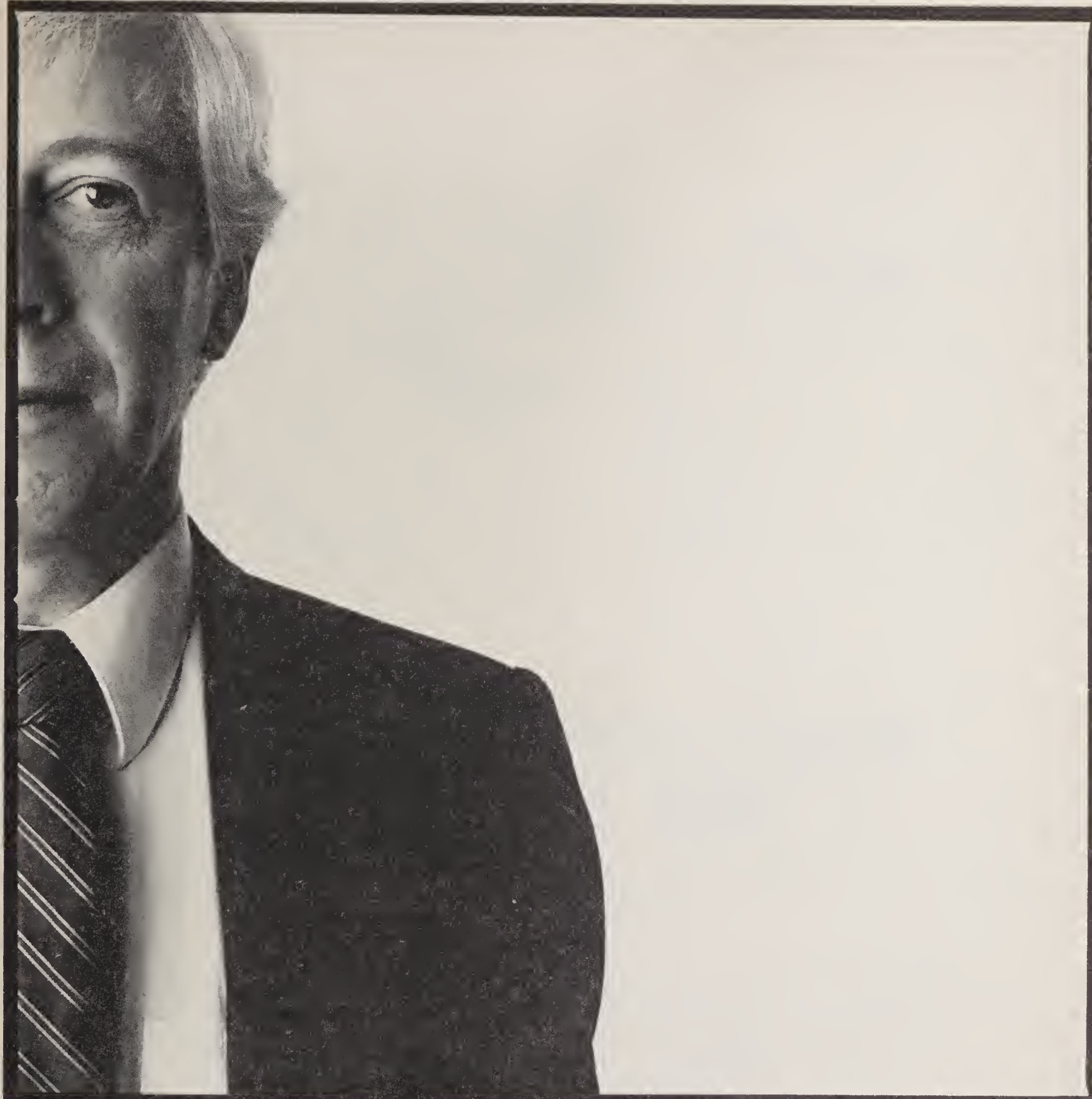
Craik's studies at the Centre for Research in Human Development, also initially financed by the Connaught Fund, involve some 400 senior citizen volunteers from Mississauga, many of them U of T alumni. One major finding of the studies is that older people hold information in their minds just as well as younger people for short-term purposes — looking up a telephone number and remembering it long enough to dial the call, for instance.

But remembering specific events from the past does seem more difficult for older people. With respect to this kind of memory, Craik finds "a large decrement with age." Yet, when older people are provided with cues, they can produce the desired information. "This is important theoretically," Craik notes, "because it means that the older person may acquire and hold information just as well as the younger. The major difficulty is retrieval."

Another difference is that younger people "encode" information in a richer and more elaborate fashion. That helps them perform better because memory is a question of relating new information to what is already possessed. "Memory is a function of what we know," Craik says. "It's not something you're good or bad at. The more meaningful you can make the incoming information and relate it to information you already have, the better you will be able to recall it." That's why athletes can remember a particular shot years after a game. The athlete's memory isn't necessarily better. It's just that the information is closely associated with the wealth of knowledge the athlete possesses.

To help older people make memory associations, Craik's researchers suggest "frameworks" of well known material to which new material can be added. A person could memorize certain familiar spots around the house, associating each with an item to be remembered on a grocery list. "It's surprising how effective this method is," says Craik, although he notes wryly that "most older people, when not instructed to use the method, forget to use it." Also, some consider that stamping the framework into their minds is "more trouble than it's worth".

But research at Erindale has shattered one misconception about older people — that they tend to forget appointments more than younger people do. Experiments conducted jointly by Moscovitch and Professor Gordon Winocur, research director of the Program in Gerontology, with research associate Nina Minde, tested older people on their ability to remember to make telephone calls at specified times each day. The seniors consistently out-performed their juniors. Concerned that the young people merely lacked motivation, researchers introduced a money lure to try to boost the young peoples' performance. Even so, the older people held their ground. "In that last study we made



FERGUS CRAIK: WITH AGE THE PROBLEM IS RETRIEVAL

the young people perform as well as but not better than the older people," says Moscovitch. "In a real-life situation, older people didn't seem worse and maybe even better than younger people in terms of remembering an appointment."

Whether it be normal memory, organically impaired memory or memory subject to the vicissitudes of age, studies at the U of T will go a long way towards pushing back the clouds of unknowing around this intriguing human function. Organizers of the Unit for Memory Disorders hope it will be established on a permanent basis. Asked what will happen when the Connaught

grant runs out next year, Schacter rolls his eyes heavenward in a prayerful look. Meanwhile, Tulving stresses the continuing need for volunteers who think they may have a memory problem and would like to help science. With courtly charm, he makes his appeal to prospective subjects as inviting as a scientific proposal could possibly be. "We are nice to them. We pay their taxi fare if necessary. We don't draw blood. There are no invasive techniques. We talk and play games."

If you think his plea applies to you or any member of your family, make a note to get in touch with the unit right away. Or tie a string around your finger. ■



PHARAOHS' BOASTS PUT TO TEST

BY ARTHUR KAPTAINIS

THEY CLAIMED THEIR ARROWS PIERCED COPPER INGOTS. WALLACE McLEOD, A WORLD AUTHORITY ON ANCIENT ARCHERY, FOUND THE MAKINGS OF A REPRODUCIBLE EXPERIMENT

THE NARROW VICTORIA COLLEGE OFFICE OF WALLACE McLeod is less a classics professor's office than a film-maker's exaggerated notion of what a classics professor's office should be. Books of a weighty and generally antiquarian character climb seven feet up the walls; a desk, blocking clear passage from one end to the other, is a great mesa of papers and journals. There is no place to set down a pocket-sized tape recorder. There is a clean, small hole through the ancient lacquered finish of the oaken door, where Professor McLeod, attempting once to shoot an arrow at a telephone book, missed.

Archery, for McLeod, is not just an eccentric alternative to the executive's putter and golf ball. It has been germane to his academic work ever since his studies in the early 1960s with Stirling Dow, the Harvard classicist who urged McLeod on to his first published paper, a monograph on four ancient Egyptian bows in New York's Metropolitan Museum of Art. His doctoral disser-

tation also concerned ancient archery: it was called, he now remembers with a self-effacing chuckle, "The Greek bow, with special reference to Homeric poems', or something like that."

Homer, of course, is what the University pays McLeod to teach. But thanks to the interdisciplinary mobility that seems to be the special prerogative of classicists, he has been able to pursue his interest in ancient archery to the extent of becoming a world authority on the subject. He has even applied it cogently to his literary specialty, crossing the thoroughfare between practical archaeology and poetry with an aplomb that might well, in other literature departments, be considered heretical.

Most recently, McLeod has overseen an experiment whose implications cross many such thoroughfares, beginning in 16th century B.C. Egypt and ending in 8th century B.C. Greece. Encountered on the way are issues in warfare, commerce, metallurgy, legends and the

Ay is shown on this piece of gold leaf shooting at an ingot. The Pharaohs' bows were fine weapons at least as powerful as the famed English longbows.

decline of empires. "It's just a small point," he says, summing up, in the singular, a plurality of thoughts, "but it provides satisfaction for me on several different levels."

At the basic level, it is a putting to the test of the boasts of a succession of New Kingdom Pharaohs that they were capable of shooting arrows through a copper ingot three inches thick. Like all Pharaohs, those of the 18th dynasty styled themselves as simultaneously human and divine, capable of any number of superhuman feats. But their obsessive interest in sport and archery distinguished them from the rulers who preceded and followed them.

It all seems to have begun with Thutmose III, by some reckonings the greatest of all Pharaohs, and one who is actually ranked among the more objective in recording his activities for posterity. If inscriptions are to be believed, he bagged 120 trophies once on an elephant hunt. He also claimed to be able to penetrate, with bow and arrow, a copper ingot three fingers (two and a quarter inches) thick. His son Amenhotep II then raised the ante by penetrating four ingots "of one palm in their thickness" (three inches).

This became the standard boast for several later Pharaohs, who also credited themselves with prodigious numbers of kills. Tutankhamen, whose tomb has yielded to posterity 30 of the 43 ancient Egyptian bows that survive, is shown on a painted plaster box leading expeditions and smiting, with bow and arrow, Nubians, Syrians or lions by the dozens. His successor, Ay, can be found piercing a copper ingot, in the manner of Amenhotep II. These achievements McLeod regards as unlikely, given Tutankhamen's death at age 18, and the fact that Ay was an old man who ruled for only four years.

Indeed, all royal boasts are suspect due to the propagandistic nature of Egyptian historiography. The Pharaoh is the son of Ra, the sun-god, and the personification of the nation of Egypt. The nation's military victories are his victories, even if he does not participate in the campaign. When he does, he vanquishes the enemy almost single-handedly. (The flattering account, by a court poet, of Ramses II's performance against the Hittites at the Battle of Kadesh is perhaps the most notorious example of this particular convention.)

But the claim of Thutmose and his descendants was oddly concrete. Amenhotep not only claimed to be able to shoot through copper ingots; he said anyone who cared to could go see the ingots on display at the Temple of Amon. McLeod saw in this boast the makings of a reproducible experiment. All that was required was a piece of copper, and an accurate reconstruction of a New Kingdom Pharaoh's bow.

The fragments from Tutankhamen's tomb give a fair idea of what these weapons were like. They were composite bows made of successive layers of wood, bone and animal tendon, much stronger and more pliable than bows made only of wood ("self bows" in archerese). Construction methods and materials were sophisticated:

ash and birchbark, foreign to Egypt, have been found in the bows that have been subjected to analysis, and there is a relief in an 18th dynasty tomb depicting what is clearly a bow factory.

No artisan himself, McLeod enlisted the help of an Englishman, Edward McEwen, editor of the *Journal of the Society of Archer Antiquaries* and a bowyer of 25 years' standing, who duplicates historical bows for fun. McLeod wanted to publish descriptions of two 18th dynasty bows he had examined in the Cairo Museum. Perhaps this could be done in McEwen's magazine, with the novel added dimension of a report on the capabilities of replicas of the bows being examined.

McEwen got right to it. He used the correct materials — ash, imported water buffalo horn and sinew from the hind leg of an ox. Strips of these were stuck together with a fish glue created on the kitchen stove by boiling isinglass, a gelatinous substance from sturgeon bladders. ("I don't know how his wife lives with him," comments McLeod.) Three bows were made, replicas of the two from the museum and a third that combined, in McEwen's judgement, their best qualities.

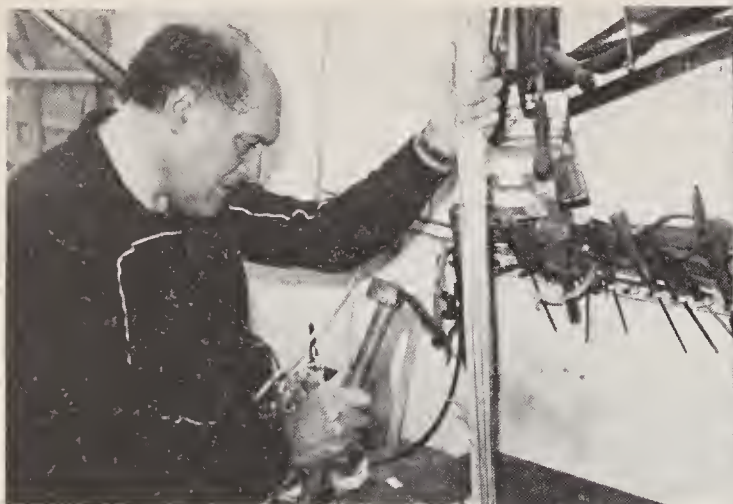
Early this year, McEwen sent the results of his field tests, along with a number of slides, to McLeod. There were interesting revelations. The bow is powerful, at least as powerful as the famed English longbow, capable of flight distances of 250 yards. (Modern archers did not exceed 300 yards until the 1920s.) It does not "kick in the hand", that is, give the archer an unpleasant vibration at the grip. In short, a fine weapon.

And the boast of the Pharaohs? McEwen managed to penetrate, but not clear, a quarter-inch ingot of copper with an iron-headed reed arrow — a rather sorry showing in light of New Kingdom achievements. Of course, McEwen does not have a sun-god for a father.

But to unbelievers in the archaeological community, the conclusion is inevitable. Amenhotep II's perforated ingots were fakes. "Mr. McEwen has more faith in human nature than I do," says McLeod. "He thinks the copper may have been full of air bubbles, or something like that, so the arrow could go through it, and make the Pharaoh look great. I'm sceptical. I picture the Pharaoh's artificers in a little back room hammering nails through the ingot."

More important than exposing the royal penchant for exaggeration, however, is reaching a conclusion about the impact of the Egyptian composite bow on the fortunes of the empire. The composite bow is assumed to be a legacy of the Hyksos, the Asian invaders who ruled various parts of Egypt during the 15th century B.C. The Hyksos also introduced the light horse and chariot, leaving the 18th dynasty Pharaohs who finally ousted the usurpers better equipped to wage war. Thutmose III (ruled 1504-1450 B.C.) established an Asian empire that extended across the Euphrates and was the first king to portray himself as a great archer. The last, perhaps significantly, was Ramses III, after whose death in 1166 B.C. the empire quickly declined.

"By a sort of *post hoc propter hoc* fallacy," explains McLeod, "one might assume there is some connection — that the reason Ramses II and Ramses III were so successful was because they had adequately trained troops using this more powerful weapon. But that's an assumption."



Edward McEwen making one of the bows. Painted lid of a box found in Tutankhamen's tomb shows him hunting lions.



tion, and it's not one of the great turning points in history."

This was a typically modest remark. "My particular discipline does not look with terrible enthusiasm on great, innovative syntheses, theories that claim to illustrate some great turning point," he explains. "I guess it's just that we've been at the history business so long we're dubious such things exist."

So McLeod is content to call his experiment, inasmuch as it affects Egyptology, an *improvement*. But he has not confined his speculations to Egypt.

It has been noticed by others that Amenhotep's assertion that only he possessed the strength to draw his bow bears a resemblance to the legend surrounding the bow of Odysseus, which could not be strung by the revellers tormenting Penelope, but only by Odysseus himself. The bow Homer had in mind was definitely composite, since Odysseus checks it "lest grubs might be eating the horns." It was also reflex, since Penelope describes it as "bent-back" and Odysseus strings it "effortlessly" while sitting in a chair, suggesting that skill as well as strength was required to deal with it. Wooden bows curve the same way unstrung as when strung. Only composite bows are reflex.

These details square with the Egyptian bows, whose horn layers are often tunnelled by insects. "But the real clincher," says McLeod, "is that one of the adjectives applied to the bow is *ankylos*, which is usually taken to mean 'curved'. But I think it is cognate with the Latin *angulus*. I think it means 'angular'." Sure enough, McLeod discovered that many of the bows of the Pharaohs show an elbow-shaped angle in the centre when unstrung. The angle disappears when the bow is strung.

The final connection with Egypt concerns what Odysseus managed to do with his bow once he had strung it. This is one of the great cruxes in Homer. We are told Odysseus shot a bronze-tipped arrow through 12 iron axes. Scholars, feeling Homer could not possibly have meant this literally, have concocted several alternative readings: axe handles, holes in axes, suspension rings on axe handles. McLeod supposes simply that Homer meant what he said, and that the feat of shooting through iron axes is a transmutation of the boasts of the Egyptian Pharaohs. In this case, the clincher is that the Pharaohs'

copper ingots look not unlike a double axe with concave rather than convex blades.

McLeod explains: "Amenhotep II brags that he went out into his garden and set up four copper ingots as targets. Here you have a king who brags about having a bow others cannot draw, and about shooting through a sequence of what look like axes.

"It seems to me what you've got in Greece is a story that goes back to Egypt. Somebody has been to Egypt and heard about this king who shot through ingots that looked like axes. He's brought home this motif, and hasn't quite understood it. He's changed the ingots to axes and the copper to iron, he's put them all in a row (i.e. like dominoes) instead of side by side."

Scholars have traditionally reasoned that Odysseus' composite bow was a Scythian model, although there is no evidence Homer's contemporaries — Greeks of the 8th century B.C. — had encountered Scythians, a nomadic race of invaders from present-day Ukraine. The Egyptian solution is more elegant geographically and chronologically. Odysseus is an archer-hero from Mycenaean times, a period contemporaneous with the Egyptian New Kingdom. The bow was popular then, as it was not in Greece of the classical period or even in Homer's Greece, where hand-to-hand combat was considered more manly. Odysseus' ability as an archer reflects Homer's view of archery as a traditional military art, common in Mycenaean Greece.

It is a long causal chain that few other teachers of literature would be willing to link together. How does McLeod explain his interdisciplinary nomadism? "One of our posturings as classicists," he says, "is that classics in itself constitutes a liberal education, because you have to know a bit of history, a bit of philosophy, a bit of science, and fair bit of literature. I suspect this is partly true.

"If you want a statement of personal credo, I think I am probably corrupted by my spiritual antecedents at Victoria College. There has been a tradition here of not being afraid to work outside your field. One of my distinguished predecessors was C.B. Sissons, a classicist, an historian, and a fellow of the Royal Society of Canada. He got his fellowship for writing a book on Egerton Ryerson — something completely outside his field. Well, I think that is healthy, if one can find the time to do it."



THE COLLEGES & THE UNIVERSITY

WHEN I FIRST CAME INTO SIMCOE HALL IN 1974 AS Vice-President — Research and Planning, President John Evans asked me to chair the Collegiate Board, to replace Jack Sword, who was going on leave. The board had been established to deal with problems arising in the relationship between the colleges and the University.

By the 1970s, rapid post-war expansion, new disciplines requiring large numbers of academic staff without previous college associations, enrolment shifts away from the traditional college emphasis on the humanities and funding pressures as salaries constituted a higher proportion of departmental and college budgets had brought changes affecting the University and the colleges. There were those who thought that the golden era of the colleges was ending. This ran strongly against historic patterns, in which the colleges provided significant portions of the academic programs in arts and science. It seemed to many that unified departments and shared resources would benefit the entire institution.

The Memorandum of Understanding signed by the University and all the colleges in 1974 sought to integrate the teaching staff and humanities departments of the colleges into unitary departments within the Faculty of Arts and Science. For several years efforts were made to strike financial arrangements which would adequately recognize the colleges' services to the faculty and encourage some continuance of their distinctive programs. The Collegiate Board was the forum in which college spokesmen vented their feelings — some fairly hostile.

A decade later I find myself in Simcoe Hall again, but in a different atmosphere as far as college relationships are concerned. A new Memorandum of Agreement has been signed; an academic role for the colleges has been reaffirmed, as has the principle of unitary departments; and a number of grievances have been resolved. The way has been opened to permit a truly unified Faculty of Arts and Science and yet ensure a continuance of the role of the colleges. There is a new sense of partnership between the colleges and the faculty — and between the federated institutions and the University.

The road to this new partnership was not easy or simple. The first stage was the appointment by President James Ham of a broadly representative working group, chaired by Professor Alex Dalzell, to re-examine the academic role of the colleges on the St. George campus. Departmental chairmen, principals of all St. George colleges and faculty and University administrators worked together and produced a set of academic principles, which would govern the relationships of the colleges to

the Faculty of Arts and Science, with recommendations to guide the financial arrangements and the relationship of the federated institutions to the University. This unanimous report led to a new Memorandum of Agreement signed by President David Strangway and the heads of the Federated Universities in August 1984.

Although the new Memorandum is concerned particularly with the relationship of the Federated Universities to the faculty and the University, it incorporates the academic principles contained in the Dalzell Report. All colleges are encouraged not only to develop distinctive programs (an objective of the 1974 Memorandum), but also to cross-appoint faculty, and to provide library, counselling and registrarial services for their students, space for multiple-sectioned courses, homes for clusters of courses and programs (which are part of the offerings of the Faculty of Arts and Science) and opportunities for their students to take more of their courses in the college environment. Agreements were reached which ensured the faculty's responsibility for quality of courses and approval of academic staff who would teach the college courses.

A principle established by the Dalzell recommendations is that funds formerly assigned from the University's operating budget to the colleges to pay for teaching provided by the Faculty of Arts and Science are now assigned to the budget of the dean, with whom the means of providing for the instructional needs of the colleges are negotiated. As a corollary, financial arrangements in the new agreement recognize the real costs of the Federated Universities' provision of services to the faculty. These arrangements are rational, systematic and durable. The key is a series of formulae that make possible annual and predictable adjustments in services and funding without renegotiation. The new arrangements not only permit but encourage the departments and colleges to undertake long-range planning and cooperative development of programs. These are some of the nuts and bolts issues which were resolved by many months of discussions and negotiations. It has been an intensive, even exhausting, experience, spanning more than a decade, devouring hours of time from many people.

It is, I believe, no small thing.

George Connell

President



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**CANADIAN IMPERIAL
BANK OF COMMERCE**

THE BENEFITS OF NUCLEAR ENERGY

BY O.J.C. RUNNALLS

THE CANADIAN NUCLEAR INDUSTRY EMPLOYS 31,000 persons directly and an additional 55,000 indirectly. Hundreds of these individuals are alumni of the University of Toronto and recipients of *The Graduate*. Many may share my view that the article entitled "Avoiding Nuclear Hazards" by Sidney T. Fisher in the March/April issue was astonishingly inaccurate and misleading in several of its claims. The purpose of the present response, therefore, is to provide a brief factual account of the current state of the civilian nuclear industry and to outline some of the benefits flowing from it to society.

The linking of the horrors of nuclear war with the peaceful nuclear industry is a conventional ploy adopted by anti-nuclear proponents with the objective of discouraging developments in the peaceful uses of nuclear energy. Mankind is rightly concerned about the dangers of nuclear war. But does the threat that hangs over all of us from the presence of huge arsenals of nuclear weapons provide a justifiable reason for banning all civilian medical programs employing nuclear-reactor-produced radioisotopes, for example? Such programs now extend the lives of many thousands who might otherwise die prematurely from untreated malignant tumours.

I would suggest that every effort should be made to sever any perceived linkages between nuclear weapons and peaceful applications of nuclear energy in order that society may continue to benefit from the products of the peaceful nuclear industry.

WORLD IMPORTANCE OF NUCLEAR POWER

Nuclear power reactors are built, not on any whim, but to serve a need for mankind. There are more than 300 commercial power reactors in service world-wide producing some 13 per cent of the world's electricity. If this electricity were to be produced by oil, about four million barrels per day would be consumed, roughly one-quarter of the present daily production of OPEC, the Organization of Petroleum-Exporting Countries. By the year

2000 nuclear generation will provide energy equivalent to the heat content of approximately 10 million barrels of oil per day. Several countries — including France, Belgium, Finland and Sweden — are already producing over 40 per cent of their electricity by nuclear means. In fact, in France the fraction is approaching two-thirds.

Although the nuclear power program in the United States has some widely publicized difficulties, these are related more to the management and regulation of the program than to the technology. As operating practices mature, more reactors there and elsewhere around the world are performing at higher outputs. In 1984 nearly half the world's reactors averaged better than 70 per cent of their theoretical maximum output. This performance, often described as annual capacity factor, was superior to that of conventional fossil-fuel electrical generating plants.

CANDU REACTOR PERFORMANCE

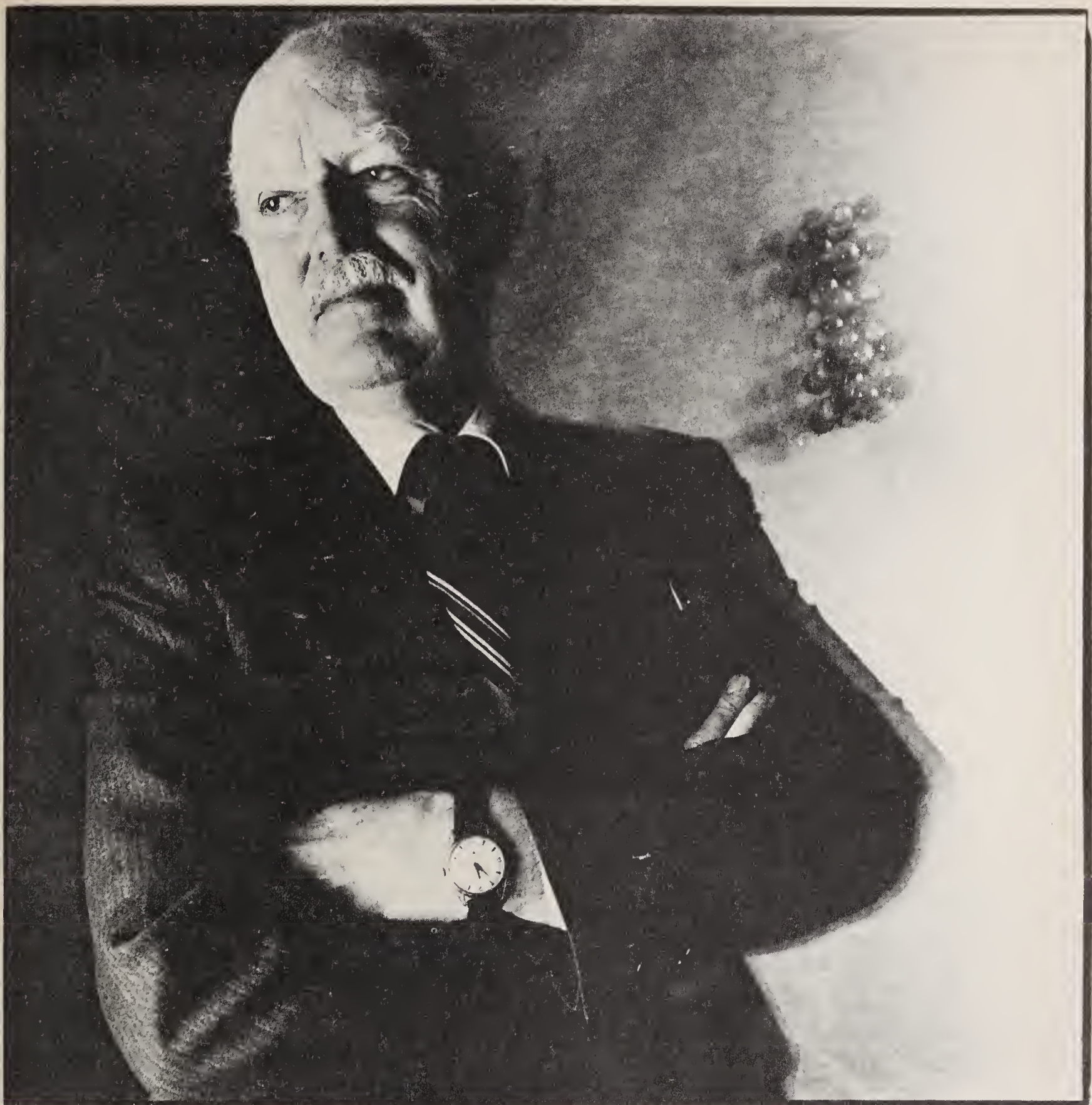
CANDU (CANada Deuterium Uranium) heavy-water-moderated and -cooled reactors have consistently outperformed all other power reactors existing in the world. The total number of large commercial units of all types generating 500 megawatts or more of electricity which were in service world-wide as of Jan. 1, 1985 numbered 186. The world's top performer was Unit 4 at Ontario Hydro's Bruce Nuclear Power Development near Kincardine with a 1984 capacity factor of 98.2 per cent and a lifetime performance after six years of operation of 88.4 per cent.

Seven of Canada's 13 CANDU reactors which were in service on Jan. 1, 1985 stood among the top 15 in the world in lifetime performance. Three of Ontario's CANDU reactors went into service after the beginning of 1984 and all have had outstandingly high monthly capacity factors since startup. However, because they had operated less than a full year, they have not been included yet in the official annual listing. The three other units missing from the list were Pickering-1 and -2, shut down to replace Zircaloy-2 pressure tubes with the superior zirconium-2.5 per cent niobium alloy used in all other CANDU reactors, and Gentilly-2, near Three Rivers in Quebec, which because of power grid restrictions was operated only as a peaking plant.

Canada has five per cent of the nuclear reactor market both in terms of total capacity and of exports. CANDU critics frequently deride this figure as proof of the insignificance of CANDU, but in so doing display ignorance of Canada's place in the industrial world. For instance, Canada produced less than four per cent of the free world's exports of manufactured goods in 1982. We rightly think of the Canadian auto industry as a prime example of a successful Canadian endeavour and yet, in 1983, Canada fabricated only 3.3 per cent of the world's automobiles.

CANDU opponents bemoan the \$3.4 billion in parliamentary appropriations that have been spent in total on Canadian nuclear research and development, cost of prototype reactors and heavy water plants over the period of the past 40 years. By comparison, the four-year-old Petroleum Incentives Program now being phased out has cost the Canadian taxpayer \$4.2 billion and there has been little petroleum to show for it.

O.J.C. Runnalls, B.A.Sc. (4T8), M.A.Sc. (4T9), Ph.D. (5T1), F.R.S.C., P.Eng., is chairman of the Centre for Nuclear Engineering and professor of energy studies, Faculty of Applied Science and Engineering, University of Toronto.



BRIAN SMALE

Professor of energy studies, in background model of a plutonium molecule

ECONOMIC IMPACT OF THE NUCLEAR INDUSTRY

Canada's nuclear industry produces uranium, electricity, engineering and high-technology services, equipment and radioisotopes for industry and medicine. It ranks among Canada's largest producing endeavours. In 1983, the nuclear business generated over \$3.6 billion in economic activity, exceeding the stimulus provided by smelting and refining, \$3.4 billion, industrial chemicals, \$3.3 billion, and communications equipment manufacturing, \$3.0 billion.

Uranium mining and refining is a billion dollar a year industry comparable to the other Canadian mineral giants — copper, zinc, gold, iron ore and nickel. Furthermore, Canada is now the largest uranium producer and exporter in the world.

To ensure that Canada's exported nuclear materials, equipment and technology are used only for peaceful purposes, the federal government evolved stringent nuclear safeguards policies more than a decade ago. They are of such a high standard that few other countries have been prepared to match them. Although these policies have been restrictive to business, they have helped to ensure that Canada's nuclear materials and expertise are used only for peaceful purposes.

In Ontario, nuclear generation is now the largest single source of electricity producing more power, in 1984, than that from either hydroelectric or coal-fired plants. The appeal of nuclear power is rooted in the fact that as an energy source it has indigenous human and natural resources to support it within the country, and it is safe,

economic, highly technological and non-polluting.

Ontario Hydro's CANDU nuclear stations produce electricity more cheaply than do the competing coal-fired plants. In 1984, for example, the total unit energy cost at Bruce-A Nuclear Generating Station including interest, depreciation, operation, maintenance, administration, fueling, heavy water upkeep, waste management and decommissioning charges, was only 1.8 cents per kilowatt-hour. This was approximately half the 3.5 cents cost from the coal-fired Nanticoke Generating Station of similar vintage and size. In fact, the coal costs alone for Nanticoke were higher than the total energy costs for Bruce.

The continuing, reliable performance of CANDU reactors has resulted in the saving of huge sums of money. Including all costs, Ontario Hydro has already saved \$2 billion from building and operating its nuclear plants compared to the equivalent coal-fired generation. By 1996 that saving will have risen to \$10 billion (1985 dollars) and the annual saving will then amount to \$1 billion.

These savings are accompanied by another most significant advantage. In a nuclear station built in Canada, 90 per cent of the total costs over the lifetime of the plant are spent in Canada on Canadian goods, services and fuel whereas for a coal-fired station in Ontario, 90 per cent of the total lifetime costs are spent in the United States, primarily for fuel. As an important additional benefit, most of the cobalt-60 radioisotopic sources used in cancer therapy machines are produced in operating CANDU power reactors. It has been estimated that such Canadian designed and built units have already provided more than 13 million person-years of extended life to cancer victims in countries around the world.

ENVIRONMENTAL IMPACT

The production of energy from each and every available source has some impact on the environment. The effects vary widely, depending on the source. For example, purified natural gas when burned has only a small measureable impact. At the other extreme is coal. Authoritative studies have indicated that 50,000 persons die prematurely each year in the United States because of exposure to fumes from coal-burning plants. The ecology also suffers considerable damage down-wind because of the formation and deposition of acid rain.

The nuclear fuel cycle imposes about the same burden on the environment as does the production and utilization of natural gas. Among all of the individuals engaged in nuclear fuel cycle operations which include uranium mining, refining, fuel fabrication, irradiation and spent fuel storage, the most significant risks are borne by underground, hard-rock miners. They face hazards similar to those who mine for gold, nickel, lead, zinc, etc.

Many electricity-generating utilities are planning to minimize the quantities of acid gas released to the environment by relying more heavily on nuclear power in future. Ontario Hydro, for instance, which currently produces about 35 per cent of its electricity from nuclear plants will see that percentage rise to 65 per cent by 1992. Then, coal's contribution will have been reduced

SOCIETY WOULD BENEFIT IF NON-RADIOACTIVE YET HIGHLY TOXIC CHEMICAL WASTES WERE HANDLED WITH THE SAME CARE AS WASTE FROM NUCLEAR POWER PLANTS



three-fold to about 10 per cent and the acid gases emitted will have dropped to less than 300,000 tonnes per year, below the limits set by government legislation.

DECOMMISSIONING OF NUCLEAR PLANTS

Many members of the public may believe that no reactor has ever been decommissioned. In fact, the Boiling Water Reactor at Elk River in the United States has been completely removed and the site has been returned to the owners for other use.

Power reactors will need to be decommissioned at the end of their useful lives in the upcoming years. All units have been financed so as to amortize the initial capital investment over long periods, 30 to 40 years of operation. However, their actual lives may be considerably longer still.

Several possible routes are available in carrying out a decommissioning operation. A currently favoured one is to remove the nuclear fuel which is the main source of radioactivity, more than 99 per cent. All useful non-radioactive or decontaminated equipment would be recovered also. The reactor building would then be sealed so that access was prevented for 30-50 years. During this period much of the residual radioactivity in the facility due primarily to cobalt activation products would have decayed away.

Dismantling of the buildings and the remaining equipment would then commence with the objective of returning the site to its original state. The relatively small volume of still-radioactive items, about five per cent of the total, would be transported in suitably shielded containers to a secure disposal site close to the surface.

Decommissioning of CANDU reactors has been studied in detail by both Atomic Energy of Canada Ltd. and Ontario Hydro. The estimated cost of decommissioning is in the order of five per cent of the original cost. A decommissioning charge is included by Ontario Hydro in the cost of every kilowatt hour of electricity sold from its nuclear plants. The sum being accumulated may be overly generous since no account has been taken of the resale value of the heavy water coolant and moderator which could be more than enough to finance the complete cost of decommissioning each CANDU reactor.

DISPOSAL OF NUCLEAR WASTES

Several possible methods for the safe disposal of wastes from nuclear power generation are already known. In 1978 the highly-regarded International Council of Scientific Unions (ICSU) established a committee to review the research being conducted on the disposal of high-

level radioactive wastes. The ICSU is responsible to no government, has no vested interest in nuclear or any other kind of power, has access to the world's scientific and technical community and reaches its conclusions on purely scientific grounds. After six years of exhaustive study, the ICSU concluded that nuclear wastes may be disposed of safely using current technology.

The question is often posed that if a satisfactory method is available now, why is it not being used? For three reasons. First, although there are good methods now in use such as those currently being employed in Sweden, even better ones are under development. Second, it may be unwise to dispose permanently of the unprocessed spent fuel from current reactors because this used fuel contains a large amount of valuable energy that could be recovered by recycling the plutonium contained in it. From Ontario Hydro's reactors alone by the turn of the century using known fuel cycle technology, the plutonium in the spent fuel in storage could produce an amount of energy comparable to that in Canada's present total crude oil reserves. Third, spent fuel after removal from a reactor continues to give off some heat. The disposal of this material is simplified if it is first allowed to cool down for some years. This can be, and is, carried out safely now on site at nuclear generating stations in water-filled storage bays.

Society in general would benefit if many of the non-radioactive yet highly toxic chemical wastes were handled with the same care as waste from nuclear power plants. Far from being a threat through all eternity as are elemental non-radioactive wastes like mercury, selenium and arsenic, the hazard from high-level nuclear waste continually decreases because of radioactive decay.

The volume of high-level nuclear waste is very small compared to the quantities of many highly toxic chemical wastes. Hence we can afford to spend substantial sums per unit volume without incurring excessive waste management costs. These waste storage and disposal costs are also provided for by Ontario Hydro through the inclusion of a surcharge on its price for nuclear-generated electricity.

The total costs of spent fuel disposal plus reactor decommissioning are not expected to exceed 10 per cent of the cost of the electricity produced in that reactor. Several utilities have already established the practice of adding a charge for fuel disposal and decommissioning costs over the operating lifetime of a given reactor. The resultant accumulated funds can be drawn upon to meet the costs as they arise in later years.

NUCLEAR ACCIDENTS

Nuclear reactors are designed to accommodate human error, to cope with mechanical failures, and to contain the effluents from very severe accidents. To date a total of 3,500 reactor-years of experience has been accumulated in the operation of commercial nuclear power reactors around the world. In all this time there has been no accident that has led to any death of a member of the public.

The most serious accident that has ever occurred at a nuclear power plant took place in 1979 at the Three Mile Island reactor site in the United States. Most of the

reactor core was destroyed as a result and some radioactivity escaped from the building to the surrounding community.

A presidential commission of experts was convened shortly afterwards to study the accident in detail. The commission concluded that the worst health consequence would be one additional case of cancer among the two million people living within 50 miles of the plant site over their remaining lifetimes. This effect will be difficult if not impossible to detect among the 541,000 people in that same population who are expected to develop cancer from normally occurring causes during their lifetimes.

Canada's CANDU heavy-water-cooled reactors have several design features which make them even safer than conventional light-water-cooled types. For example, several hundred small diameter pressure tubes are provided in the core of the reactor to contain the fuel and the high temperature cooling water rather than a single large pressure vessel. Also, a large volume of low temperature water, the moderator, surrounds the pressure tubes and is available to act as a heat reservoir if the main cooling flow should ever be curtailed.

A few years ago, a select committee of the Ontario Legislature was formed to study the CANDU reactors incorporated in the Ontario Hydro system. The group was made up of individuals from all three parties represented in the House. The committee exhaustively examined the safety of CANDU, and concluded that the reactor system was acceptably safe.

SUMMARY

Canada's nuclear industry has brought significant benefits to the country and to many nations abroad through the development of:

- world-leading uranium exploration, mining and refining endeavours;
- internationally-respected nuclear research and development activities;
- the CANDU reactor, the world's best commercial nuclear power plant;
- a sophisticated radioisotope production, packaging, distribution and utilization capability which has relieved suffering and improved the quality of life for untold millions around the world.

It has done all of this under the umbrella of a carefully formulated and firmly administered government policy based on adherence to the principle of using nuclear energy only for peaceful purposes.

Some individuals will undoubtedly continue to preach that the dangers of nuclear war are intensified by the development of the peaceful nuclear industry. An educated, thoughtful public will eventually reject such discourse as mere rhetoric.

If a process has been devised which will "generate needed energy commodities economically, using indigenous resources, almost without pollution, environmental damage or human hazard" as was mooted at the beginning of the article in the March/April issue of *The Graduate*, it is unlikely to be related to "the exploitation of solid fossil fuel deposits". Rather, the quotation aptly describes the current and foreseen benefits flowing to society from the peaceful nuclear industry. ■

LANGUAGE, LEARNING & TORTURED SYNTAX

I WAS PUZZLED BY THE IMPECCABLY-classical Greek words coming from the lips of an ancient Greek (or Victorian Englishman?) in modern dress on page 21 of the March/April *Graduate* in an illustration to the article on language-learning by Professor Marcel Danesi. The statement must be translated as: "When the spring came at a specific time in the past, at that time in the present the flowers are blooming." Though different languages say things differently, and all translation involves some distortion, an ancient Greek would find this as baffling as I do!

Another point: the writer states that Herodotus attributed the differences in Egyptian and Greek behaviour to the different directions in which they wrote their languages, but in fact the "father of history" did not say this. Rather, he clearly implies that it was the peculiarity both of their climate and of the Nile river which accounted for the general oddity of the Egyptians as compared with Greeks and other peoples. He then gives a long list of their odd customs, one of which is the direction of their writing, but he seems to attach no special importance to it. He was moreover misinformed, for the Egyptians in fact wrote from left to right as well as from right to left, and even vertically on occasion! (I was properly informed about this by a colleague in Near Eastern studies.) By the way, some early Greek inscriptions were written from left to right and right to left — the "plough-turning" method.

In any case the character of a (spoken) language, and its possible influences on a people's world-view, thought etc. (or *vice versa*), is surely a different phenomenon from the method adopted for writing it.

R.M.H. Shepherd
Professor of Classics
University College

Artist Gail Geltner reports that the passage came from First Greek Book:

Letters may be edited to fit available space and should be addressed: Graduate Letters, Department of Communications, University of Toronto, Toronto, M5S 1A1.

Comprising an outline of the forms and inflections of the language, a complete analytical syntax and an introductory Greek reader with notes and vocabularies by Albert Harkness, Ph.D. (Copp Clark and Co., Toronto, 1876); page 191. The translation given, says Geltner, is "When spring comes, then the flowers bloom."

Editor

The article, TA Strike Vote: If At First ... in Campus News in the March/April issue of *The Graduate* is shoddy journalism. The language is inflammatory, the reporting is biased, and some of the conclusions are utterly fantastic.

First, the language: you call articles by the TA union president "polemics", whereas an article by a vice-provost is "a column". Why? You give no reason for the distinction but it sets the tone for the rest of the article. Union proposals are described full of scare quotes — "job protection", "quality working conditions", "hiring", "overwork" — whereas administration proposals are not similarly flagged. Why not? This is irresponsible.

But this pales next to the reporting and the conclusions you drew. Did you examine the teaching conditions of TAs at U of T? No. Did you call the union office for information or clarification? No. Did you read any of the union's literature? Apparently only the two "polemics". Nor, apparently, did you do any research into the administration's position.

This doesn't stop you from drawing sweeping conclusions, however. For example, you write, "It really came down to a fundamental question of status. Is the teaching assistant a labourer or a student?" Further on, you refer to "the executive's conclusion that [TAs] are full-fledged members of the proletariat." Now, since you did not bother with research, where did this mind-boggling conclusion come from? From a "telling reference...to 'job protection' and 'quality working conditions'" in one *Varsity* article!

For the record: the union executive has never said, nor do we believe, that TAs are "labourers or students", much less that we are "full-fledged members of the

proletariat." We are *students who work*. Our negotiations were designed to ensure that we get paid for the TA work that we do, and that jobs not be given to non-students when qualified students are available.

You are, of course, entitled to your own opinions concerning the recent TA contract negotiations. However, basic principles of fair reporting require that you at least back up your opinions with facts. You did not do this, nor could you have, had you only bothered to contact the union. Your article is an insult to the intelligence of your readers — some of whom are current or former TAs.

Karen Wendling
Vice-President
Canadian Union of Educational Workers
Local 2 (U of T)

Having spent my entire undergraduate life in the botany, zoology and hygiene buildings, I never felt a great kinship with the rest of the University. It has only been in the last few years, through reading *The Graduate*, that I have acquired a sense of belonging to the U of T as a whole.

I particularly enjoyed this issue's articles: Tracking Down the Origin of Thought (how marvellously interdisciplinary the maths and sciences are now!) and From Russia With Luck. The latter article persuaded my 18-year-old son to attend U of T next year.

I'm rather glad that *The Graduate* does not carry class notes. I detest cute statements as to who is doing what, now.

Ingrid (Mearns) Kern
Pickering

Apart from Aftermath, which gives this language-and-letters man an inferiority complex, I spent the usual hour perusing all the articles in the March/April issue, not excluding Karen Alton's people-watching feature, View from the Window Seat. It's the St. George campus a little after my time, but no matter. What

Nor, as an undergraduate, did I, and I guess the reason was simply that even forty-plus years ago, U of T was too big and impersonal to excite in me personal attachment and loyalty. So our university fight-song to which she refers never “turned me on” in my undergraduate career.

Which explains that, as of that unforgettable moment, I have always and fervently care for Our Song . . .

When I saw the picture on the cover of the Jan./Feb. issue the first question that entered my mind was: "Why are there not any black students in the group?"

When I attended the University of Toronto (Victoria College) from 1969 to 1975, there were many black students attending and there should be now as well. I wondered why just one black student could not have been among the group. I hope that you will reply with a reasonable explanation.

We chose students who were articulate, and decided that both sexes, all years and constituent and federated colleges should be included. It never occurred to us to consider anything else.

The article Avoiding Nuclear Hazards in the March/April issue is so loaded with inaccuracies that it cannot be left unchallenged. The facts are in the public domain, so that it is not (nor should it be) necessary to compromise top secret sources in order to refute it.

To select just a few of the many examples, the article states: "The hydrogen bomb explosion, hundreds of times more powerful than the atomic bomb, results when two light atoms are fused at very high temperature . . ." In fact, the hydrogen bomb *is* an atomic or nuclear bomb. A fission bomb is meant, but it is possible to boost a fission bomb into the megaton range by using a lithium deuteride primer and a depleted uranium shell. Thus it is possible to reach megaton level without using the heavy hydrogen isotope tritium, which is normally used in "clean" megaton-level hydrogen bombs. Therefore, stopping tritium production anywhere will make little or no difference to the risk of nuclear war. Also because physically enriched (non-reactor) uranium makes a useful basic explosive, stopping nuclear power reactors would make no difference either.

It is clear that nuclear power must be evaluated not on military grounds but at

the level of public safety. Let us now examine the relative hazards of the common energy sources. In his forthcoming book, Herbert Inhaber uses person-days lost by injury or death (pdl) per unit block of convertible energy. In his case a megawatt-day electric equivalent. Because coal produces more deaths at old age, he actually gives coal a macabre advantage. Nevertheless his pdl figures come out in this order: coal 600 to 1900; solars 40 to 130; nuclear 5 to 15; natural gas 1.5 to 4.8 pdl.

The article states: "No assurance of the safety of nuclear power can or should be given. Anyone who gives such public assurance should be discredited and removed from a position of power or influence immediately and permanently." In fact, no trained nuclear engineer or proponent has wilfully done that. Our energy or military problems cannot be solved by burning nuclear engineers at the stake. In view of Dr. Inhaber's figures, it might be better to consign solars and coalers to the flame.

*Douglas G. Andrews
Professor Emeritus of Nuclear
Engineering
University of Toronto*

From a childhood in revolutionary Russia to the top circles of Canadian diplomacy, this fascinating story is told with warmth and humour. (See excerpt, *The Graduate*, March/April, 1985.)

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If you're Kenneth Money, you become an astronaut.

"It was a natural for me. My two major interests — motion sickness research and flying — were both involved," explains the 50-year-old U of T alumnus. "I had my application in before the ad appeared for jobs with the Canadian Astronaut Corps."

Money, who is a Victoria graduate, received his B.A. in 1958, his M.A. in 1959 and his Ph.D. in 1962. He did his fourth-year thesis on the organ of balance of the inner ear and continued this research for his doctorate. This work led naturally to research in motion sickness with his thesis supervisor, NASA consultant Walter Johnson.

"I joined him in 1962 and also became a research scientist with the Defence and

Civil Institute of Environmental Medicine in Downsview." Money has also worked part-time in the U of T Department of Physics since 1961, achieving the rank of associate professor in 1972.

The screening procedure for aspiring astronauts is rigorous. "There were several interviews and even a public speaking contest. After 23 years of practice, teaching at U of T, I was used to that. About 10 per cent of the astronauts' time is spent doing public relations," explains Money. "There were also extensive medicals that lasted two full days and involved 21 needles. They were drawing blood out of us at such a rate I thought I was going to be bled dry."

When it was all over, Money was selected, one of six Canadian astronauts and the only one who did all of his studying at U of T. The only woman astronaut, Roberta Bondar, received her doctorate in neurobiology from U of T in 1974 but is now claimed by McMaster.

"We had her first," Money laughs.

Once selected, the astronauts began working their way through 17 workbooks on the NASA shuttle system on everything from computers to first aid.

Money's specific interests in the space

program are life science experiments, particularly those concerning motion sickness. He's working on three experiments that he hopes to conduct in space. He will compete with two other Canadians for a spot on a flight scheduled for 1986.

"We're trying to develop techniques for predicting who will suffer from motion sickness," he says. "We've exposed the Canadian astronauts to a variety of motion sickness tests."

"Second, we're trying to determine how to manage motion sickness in space when it occurs. We're testing which head movements produce motion sickness and asking if there are one or two things you should never do — like nodding or shaking your head."

"Third, we're experimenting with techniques to prepare yourself on earth to prevent sickness in space. It might be that if you make yourself sick for 30 days before a flight you may resist sickness in space. This is called pre-habitation. The Russians have been experimenting with it but they haven't succeeded yet."

"We're pretty sure that what's happening in space is the same as on earth. That's one of the things we want to confirm," says Money of the life sciences program. "Whatever we learn will have applications on earth."

A BRACE OF SOCIALISTS

Stephen Lewis addresses Woodsworth Alumni

SOME 280 GRADUATES AND FRIENDS attended the Woodsworth College Alumni Association's annual dinner in February to hear Stephen Lewis, Canadian ambassador to the United Nations.

After greetings from President George Connell and a sympathetic introduction from Chancellor George Ignatieff, himself a former ambassador to the UN, Lewis prefaced his address by referring to his own ties to Woodsworth College.

"This evening is the pinnacle of a dismal and checkered academic career," he explained. "With two pass courses in fourth year outstanding, I have a far more legitimate reason to attend

Woodsworth College than the two speakers who preceded me.

"I also expect that my natural socialist proclivities will be received with some sympathy at Woodsworth," said the former leader of the Ontario New Democratic Party. "My mother tells me that J.S. read me Marx at the age of three."

Speaking on "The United Nations at 40: death or transfiguration," Lewis provided what he termed an enthusiastic and shameless appraisal.

"I love it," he said of his new job. "This is a wonderful country to represent. We have an extraordinary reputation in that body. The regard Canada has has few limitations."

Lewis contends that the UN remains a worthwhile international forum, even with its difficulties and detractors, and pointed to three areas of significant accomplishment.

One is the activities of the specialized agencies, from UNICEF's mass distribution of the important oral rehydration packet to the efforts to establish economic infrastructures in developing countries.

Politically, the UN provides a forum for antagonists to exchange ideas without losing face. Lewis also interprets the now active role of the secretary-general as an interventionist strategy with the ability to attempt to put out fires before they erupt.

Finally, Lewis turned to the UN record on social issues, citing the conventions on international drug trafficking and on torture and the declaration on the African famine which deals with the immediate emergency as well as suggesting a blueprint for the future as significant actions that have occurred since he became Canada's representative in October.

"The 40th anniversary of the United Nations is worthy of commemoration," Lewis concluded. "It had better last another 40 years. The United Nations represents a cherished moment of sanity in a world perched on the precarious precipice of self-destruction."

Shirley Williams first Women's Centenary Lecturer

"CANADA HAS ONE OF THE HIGHEST proportions of women in public life in the industrialized world," said Shirley Williams in the first Women's Centenary Lecture in March, "but the record is still not impressive."

As a former cabinet minister in the Labour government of Harold Wilson and one of the founding members of the British Social Democratic Party, Williams was eminently qualified to deliver the inaugural lecture on the theme of

"Women in Public Life". Another feminist credential is the fact that Williams is the daughter of Vera Brittain, author of *Testament of Youth* and its sequels detailing life in Britain during World War I and after.

Citing statistics to prove that the United States lags behind Canada and Britain in the proportion of women in public life, Williams suggested a provocative theory to explain this difference.

"We are a monarchy," she said. "It is impossible for anyone, boys and girls alike, to study history without becoming conscious of women in positions of authority — Elizabeth I, Victoria, Elizabeth II. Anyone in the civil service or the armed forces takes an oath of loyalty



Shirley Williams and fellow Social Democrats in front of Big Ben

to a woman." Consequently, it is easier both for women to strive for positions in public life and for men to accept them. She also cited Sweden, Norway and the Netherlands, all monarchies where a high proportion of women enter public life.

Williams also remarked that, among women who achieve positions of authority in public life, those who attended single sex colleges far exceed those who attended co-educational institutions. She suggested several reasons. A survey in Britain conducted while Williams was minister of education revealed that the proportion of girls who studied mathematics and science was three times higher in single sex schools. Girls in single sex schools also assume positions as student leaders and are exposed to a positive role model in their women principals.

"This says something rather disturbing about sexual stereotypes," she concluded

Announcement



Class of 2007

John Williams hasn't decided which university he'll attend. He probably won't make up his mind until he learns to read in a year or two. But today he took his first step toward higher education. His parents enrolled him in the Canadian Scholarship Trust Plan which is sponsored by a non-profit corporation, the Canadian Scholarship Trust (C.S.T.) Foundation.

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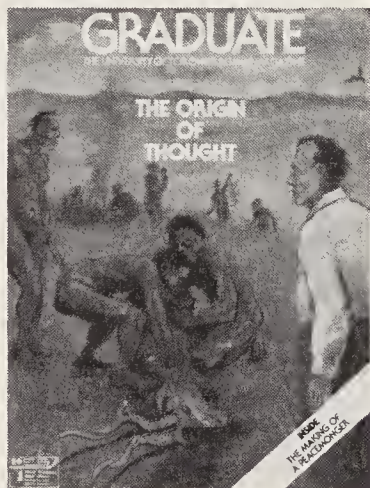
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and suggested that remedies might be sought within the school system.

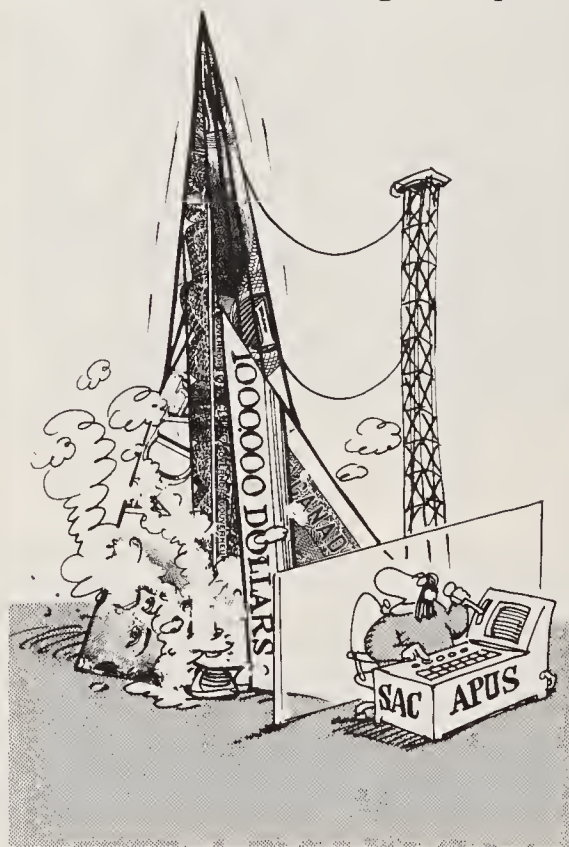
The Women's Centenary Lecture recognizes the 100th anniversary of the admission of women to the University of Toronto. An anonymous alumna contributed \$35,000 to endow the lectureship, one of three goals of the Women's Centenary Fund which seeks to raise \$100,000 during the 1984-85 academic year.

A final event celebrating the 100th anniversary will be a garden party on May 31 at the President's house at 93 Highland Avenue. Those wishing to attend should contact Elizabeth Wilson at 978-4352 for details.

\$100,000 CHALLENGE LAUNCHED

THE STUDENTS' ADMINISTRATIVE COUNCIL (SAC) and the Association of Part-time Undergraduate Students (APUS) have launched the \$100,000 Challenge, a fund-raising appeal to students graduating this June.

"The \$100,000 Challenge will prove



that students appreciate the value of the education they receive from the University," says SAC external commissioner and U.C. student Nye Thomas. "We're in the best position to recognize the University's needs and the effects of underfunding. With the \$100,000 Challenge, students will no longer just be complaining about under-funding. We're putting our own money where our mouths are."

Students represented by SAC and APUS received a mailing in early March

inviting them each to pledge \$100 to the U of T over the next three years. The campaign encourages students to choose whether their gifts will support their faculty or college, some other area of concern to them or the area of greatest need. The U of T Department of Private Funding underwrote the \$10,000 cost of the campaign. Campaign organizers hope that the class of 8T5 will provide \$100,000 for worthwhile University projects.

"The Varsity Fund welcomes this student initiative," says Private Funding's Charlotte Caton, who served on the campaign planning committee. "The \$100,000 Challenge introduces students to the concept of the role of the graduate. As well as providing funds for the University, it will make students aware that when they receive their degrees and embark on new careers they don't leave the University community. As alumni they can play an important part in insuring its continued excellence."

To add some more excitement to the campaign, APUS president and Trinity student Dan Abrahams has issued a challenge of his own.

"APUS is challenging full-time students that we can contribute more per capita to this fund than they can," Abrahams explains. "I believe that part-time students are every bit as generous as full-time students and we're going to prove it."

BEQUEST TO MANAGEMENT STUDIES

A RECENT BEQUEST OF \$262,000 WILL enable the Faculty of Management Studies to establish a professorship and an annual public lecture in marketing.

Patricia Ellison (U.C. 4T5), who died in July, pursued a distinguished career with General Motors of Canada Ltd. at a time when opportunities in the business world were rare for women. Joining the company in 1952 as Frigidaire Canada's home economist, she later moved into consumer and public relations and held the position of manager, quality emphasis on her retirement in 1980.

Her bequest is a result of her desire to see expanded and enhanced opportunities for young graduates entering the business world.

"Support of this kind helps the Faculty of Management Studies maintain its leadership in business scholarship and research," says Dean Douglas Tigert. "This gift strengthens the vital links between business and business education. Patricia Ellison sets a fine example for future support of the faculty."

UTAA HONOURS FACULTY, STUDENTS

FRANCESS HALPENNY AND JOAN FOLEY made history in April as the recipients of the annual Alumni Faculty Award presented by the University of Toronto Alumni Association. It was the first time that a woman has won and also the first time it has been awarded jointly.

"The decision was difficult to make," says selection committee chairman Jack Wright (Trinity 3T6). "Finally we agreed unanimously that, on the strength of their qualifications and accomplishments, we had to make a joint award." It is just a



Alumni Faculty Award winners Joan Foley (standing) and Francess Halpenny with Moss scholars Marcel Behr of Vic and Mark Kingwell of St. Mike's (seated). A happy coincidence that two women were chosen during the year celebrating the centenary of admission of women to U of T.

happy coincidence that two women were chosen during the year celebrating the 100th anniversary of the admission of women to U of T, Wright says.

Professor Halpenny spent her childhood in Glengarry County. She attended

University College, receiving her B.A. in English language and literature in 1940 and her M.A. in 1941. On graduation, she joined the University of Toronto Press, but left the following year to serve in the RCAF. She rejoined the Press after the war and served as its managing editor 1965-69. In 1969, she became general editor of the Dictionary of Canadian Biography, a position which she still holds on a part-time basis.

Among other honours, she has received six honorary degrees, is a companion of the Order of Canada and was awarded the Canada Council's Molson Prize in 1983 for her contribution to the arts, humanities and social science. Since Professor Halpenny was unable to attend the award presentation, the UTAA arranged a special ceremony in the Faculty of Library and Information Science. She has taught in the faculty since 1967 and served as dean 1972-78.

Born in Sydney, Australia, Professor Foley received her B.A. and Ph.D. in psychology from the University of Sydney. On completing her doctorate in 1960, she moved to Toronto where she joined the U of T Department of Psychology in 1963 and achieved the rank of professor in 1975. Among other administrative posts, she has been associate dean of arts and science, 1971-74, chairman of the Division of Life Sciences at Scarborough, 1975-77, and principal of Scarborough College 1977-84. During her term as principal, the Associates of Scarborough College, a support group of community leaders, was founded.

Currently Professor Foley's major research interest is in human spatial cognition. She is attempting to determine how people comprehend their environments and how they orient themselves in environments they are encountering for the first time.

Also awarded at the April 10 dinner were the 1985 Moss Scholarships, worth \$6,500 each, to Victoria biochemistry student Marcel Behr and St. Michael's English and philosophy specialist Mark Kingwell.

As well as maintaining a first class average throughout his undergraduate career, Marcel has been active in college life as a member of the Orientation Committee and the Board of Regents and several of its sub-committees. An avid athlete, he played hockey, basketball and soccer for Vic and was a member of the U of T Ski Club.

He lives at the Kappa Alpha fraternity and served as its secretary in 1984-85. "I kept minutes of the meetings and gave a five to ten minute paper each week," he says. "I learned a lot about expressing myself and about being observant. I spoke about things like pride, motivation,

death, third world relief, animals in research. I also started putting a gossip column in the minutes and everybody came to the meetings to hear it. When it got out of hand, I gave a speech on what gossip is."

Marcel plans to enter medical school in the fall and anticipates that in the future he will combine his medical and research interests.

In 1983-84, Mark Kingwell not only achieved an A in a graduate seminar that he took as a special reading course, but also was editor-in-chief of *The Varsity*. His other extra curricular activities include writing for *The Varsity*, *The Mike* and *The Goblin*, editing the student handbook and the *University of Toronto Review* and serving on SAC and Hart House committees. He was also master of ceremonies at St. Mike's Kelly's Korner Koffee House, organizer and participant in the St. Michael's College Baseball All-Stars and shortstop for *The Varsity* Thunderbirds softball team.

"We represented *The Varsity* in the U of T intramural league, co-ed division. Our official no wins - 10 losses record is belied by the fact that we did, in fact, win several games on the field but were disqualified because we never had enough women players," says Mark.

"My major academic interest is the influence of popular understanding of myth on political reality. I am interested in saying something about our current self-understanding of political situations," he explains. "This year, I am writing a senior essay about the nuclear situation and how it's affecting us spiritually and what we can do about it."

Mark hopes to attend Oxford in the fall to do a B.Phil. in philosophy.

NAME THE KOFFLER CENTRE THEATRE

THE THOMSONS PAID \$4 MILLION TO name Toronto's Roy Thomson Hall but all it takes to name the Drama Centre's new theatre in the Koffler Student Centre is \$1,000 and a little bit of luck. Each contribution of \$1,000 will buy a seat in the theatre and a chance to name the theatre after the relative, friend or thespian of your choice. If Aunt Sally wouldn't appreciate the honour how about Mary Pickford, or Marie Dressler, or Raymond Massey.

The draw to pick the winner will take place at the gala opening of the Koffler Centre on September 5. There are only 170 seats so act now.

Information is available from the Department of Private Funding at 978-2171.

A NEW TWIST TO THE ANNUAL TIGHTROPE WALK

THE EFFECT WAS DRAMATIC. THIS year's budget — balanced, and therefore satisfactory from an accountant's point of view, but, to members of the shrinking University community, a lengthy, cold and depressing document — was accompanied by a statement from Provost Frank Iacobucci describing the effects of budget cuts on the academic divisions.

The Faculty of Arts and Science has placed enrolment limitations on four more programs and may raise grade point cut-offs for other programs where enrolment is already limited. The Faculty of Applied Science and Engineering is going to have to start selling computer time, thereby reducing the amount available to students, in order to acquire the money to upgrade computing facilities. The Faculty of Dentistry's computing system, once a model for other dental schools, is decaying because it has not been properly maintained and upgraded.

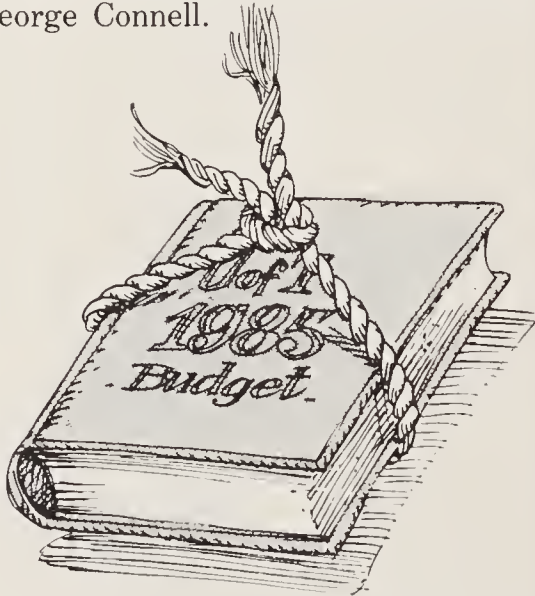
The Faculty of Medicine is not healthy. Annual base budget reductions over several years have lessened the effectiveness of teaching, research and recruitment there, said Dean Frederick Lowy. Clerical staff has been cut to a minimum, but there has been no corresponding increase in word-processing equipment that would compensate for the cuts in staff. Lowy, a psychiatrist, theorized that as enthusiasm, initiative and flexibility have been thwarted, departmental chairmen have developed an adversarial attitude toward the rest of the University.

"After seven years of watching the annual tightrope walk," said William Birt, vice-chairman of Governing Council, at the joint meeting of the Business Affairs and Planning and Resources Committees, called to consider the budget report, "for the first time we have some indication of how badly the rope is getting frayed."

The rope has got shorter by an average one per cent in the academic divisions and 1.2 per cent in the others. Expenses are expected to rise next year by \$20.2 million. An estimated salary raise of three per cent plus merit pay and progress-through-the-ranks will require a \$14.4 million increase. A \$2.7 million increase in such obligatory expenses as utilities and tuition waivers for employees

and a \$3.1 million increase in discretionary expenses are anticipated. Since income will rise by only \$13.2 million, \$7 million has had to be made available by internal re-allocation.

That means discretionary spending has had to be severely curtailed. The cost of major initiatives to be introduced next year will be about \$1.7 million compared with \$2.7 million this year and \$4.3 million in 1983-84. For a research university devoted to the pursuit of excellence, that is a lethal blow. The budget was designed to minimize the risk to academic programs and administrative operations and contains little evidence of bold new ventures, said President George Connell.



Though complement reduction has not been explicitly budgeted for, it will occur next year through attrition and non-replacement. Some contractually-limited-term appointees will not be replaced, said Iacobucci, and "we may have to look at terminating administrative staff for fiscal reasons." Administrators at Scarborough and Erindale, which have had to absorb budget cuts of 1.5 per cent, have done more than look. Seven of the 17 positions in their library cataloguing operation, Scarborough Erindale Technical Services (SETS), will be eliminated this summer when the centralized unit at the Robarts Library on the downtown campus is dismantled and dispersed.

SETS was established 20 years ago, and most of the employees have between five and 20 years of service. They are protesting that they should have been given a year's notice and asking that they

be retained even if the positions have to go. Less senior employees in the college libraries would then have to be bumped.

"The administration says that on account of the budgeting process more notice couldn't have been given," said David Askew, president of the University of Toronto Staff Association. "But if the budgeting process doesn't allow for humane treatment of employees, then one-time-only money should be built into it."

There are no longer obvious areas for budget reduction. "Each unit pays a significant price in scope of operations or effectiveness of service," said Connell.

STAR-STUDDED CELEBRATION

THE FACULTY OF ARTS AND SCIENCE and the Department of Astronomy have organized a number of public events to celebrate the 50th birthday of the David Dunlap Observatory, which falls on May 31. There will be four public lectures by U of T astronomers, on stellar spectra (May 20), variable stars (May 21), radio astronomy (May 22) and binaries and black holes (May 23). The Canadian Astronomical Society, meeting at U of T late in May, is sponsoring the inaugural Helen Hogg public lecture, May 28, in the auditorium of the Medical Sciences Building. The speaker is Harvard's Owen Gingerich; the topic is The Mysterious Nebulae, 1610-1924. And, July 11-14, there will be a conference on the study of variable stars using small telescopes, which is open to amateurs.

For details about the celebrations write to the Department of Astronomy or call 416-978-4352.

FORECAST FOR SIGMA XI

THERE IS A DIFFERENCE OF OPINION regarding the reason climatologist and Trinity College Provost Kenneth Hare was elected president for 1986-87 of the scientific society Sigma Xi. Ask Hare himself, and he says the society probably

wanted to emphasize its international character during its 100th year. "So they looked around up in Canada to see whom they could pick. They picked me."

Chemical engineer Morris Wayman, head of Sigma Xi's recently established U of T chapter, has a different view of the appointment. "I think he's being modest," he says. "He's going to be president because he's a great man — a world leader in science policy and recognized as such."

You choose.

A FAREWELL TO ARROWS

MICHAEL FINLAYSON, A U.C HISTORY professor who has made no secret of his critical opinions on the administration of the University, was acclaimed president of the U of T Faculty Association in March. Finlayson earned himself a reputation for being out-spoken during his two terms as UTFA president from 1979 to 1981 and more recently as a Governing Council teaching staff representative.

Finlayson's farewell speech to Council — from which he resigned to avoid any appearance of a conflict of interest — was delivered very much in this spirit. He called the unicameral governing system "moribund" and characterized Council as a shield used by the administration "to ward off the arrows of its critics".

Regarding the UTFA certification debate, halted last December by agreement in the Article 6 negotiations (Campus News, Jan./Feb.), Finlayson said it was not "permanently stopped", adding in an interview that he felt certification would come about "sooner or

later". What would certainly resuscitate the debate, he said, would be a decision by Council to repudiate the salary recommendation of a dispute resolution panel. (Such a panel is appointed if mediation fails.)

In the interview, Finlayson, asked to describe himself, summed up his approach this way: "I respect authority less than lots of people. I don't believe something to be true simply because somebody who's an authority thinks it's true. In fact, that tells me it's probably not true. Whatever that suggests, I am."



A DUBIOUS DISTINCTION

IT IS NICE TO KNOW THAT PEOPLE THINK U of T diplomas are worth forging. At least 17 ersatz graduates bought Varsity parchment hot off the presses from the Alumni Arts Co. of Grant's Pass, Oregon, an organization put out of business late last year by the FBI. U of T has sent registered letters to the customers — some of whom took courses at, but did not

graduate from, U of T. Possessing a hot diploma is not a crime in Ontario, as it is in some American states, although falsely representing yourself as a graduate to an employer is. McGill, incidentally, was the only other Canadian university on the Alumni Arts honour roll.

IS ANYONE LISTENING?

AN INTERESTING DRAMA PLAYED ITSELF out in the Governing Council meeting in March. It began when William Broadhurst, chairman of the Planning and Resources Committee, was called on by St. Clair Balfour, chairman of Council, to move acceptance of the University's favourable response to the Bovey Commission report. Before Broadhurst had begun to speak, the chamber doors opened and about 35 demonstrators quietly filed into the observers' chairs. Broadhurst then announced that President George Connell wished to comment on the motion.

Connell explained that student leaders, "who for whatever reason" had not spoken up earlier, informed him the day before that they wished the motion for approval deferred until they had expressed their views on the report. Council agreed to wait until the students had been consulted.

With the Ontario government steadfastly withholding approval of the commission's report, all responses, favourable or otherwise, may be in vain. Said Connell regarding the U of T response: "For a variety of reasons, the urgency I felt some time ago with respect to this brief has been diminished."

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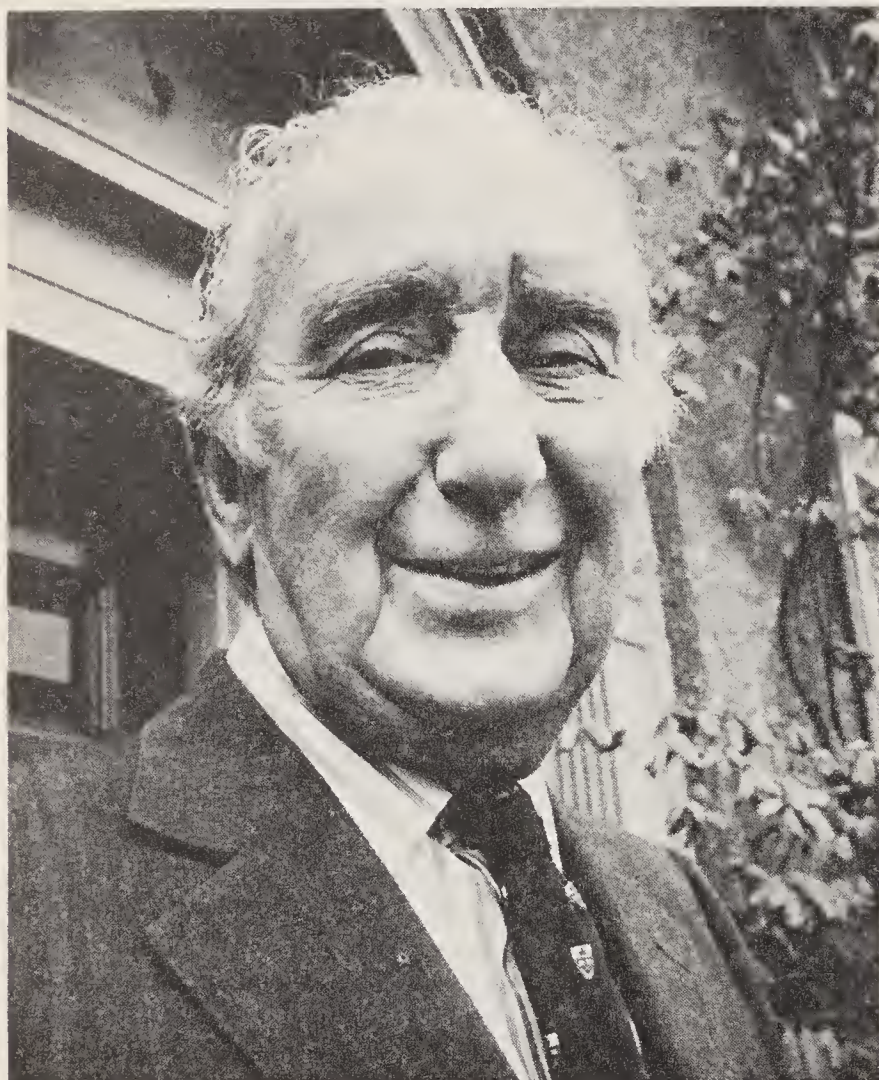
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VARSLITY FUND ANNUAL REPORT 1984



Plans to improve upon our success in 1985 include testing the results of our market research, making our appeals to graduates more personal and, most important, involving more and more volunteers to assist in this crucial endeavour.

To everyone who participated in the 1984 Varsity Fund, my thanks for making it such a success. To those of you who didn't respond to last year's campaign, please join us to ensure even more splendid results in 1985.

Sincerely,

Malim Harding
Chairman
Varsity Fund

MESSAGE FROM THE CHAIRMAN

In 1984, the Varsity Fund for the first time in its history passed the \$2 million mark. Some 20,028 graduates contributed \$2,325,263 – an increase of 1,739 donors and \$391,132 over 1983. In fact, in the past two years, the Varsity Fund has increased by over 65 per cent. It is gratifying to see such a clear indication that more and more graduates are recognizing the needs of the University and accepting responsibility for insuring its continued well being. The following report, our second annual, provides information about who helped to raise the money, who gave it and where it went. I am sure you will read it with as much enthusiasm as I did.

Although we are all delighted with these results, I must point out that the Varsity Fund does not represent total alumni giving to the University. Many alumni contributions to the Presidents' Committee do not appear in the Varsity Fund. The 1984 report on the Presidents' Committee will appear in the September *Graduate*. 2,398 graduates of Trinity College, which does not participate in the Varsity Fund, contributed \$298,358. Over 1,500 doctors donated \$124,465 through the Medical Alumni Association. In addition, many alumni make direct contributions to their colleges, faculties and departments which are not reflected in the Varsity Fund.

VARSLITY FUND EXECUTIVE COMMITTEE 1984-85

Brian Buckles (*Trinity*)
George Edmonds (*Victoria*)
William Farlinger (*Victoria*)
Ted Gerson (*Engineering*)
Eric Hardy (*U.C.*)
Joan Johnston (*St. Michael's*)
Richard Potter (*Law*)
Tennys Reid (*Erindale*)
Ted Wilson (*Forestry*)

VARSITY FUND BOARD MEMBERS 1984-85

<i>Architecture and Landscape Architecture:</i> Douglas Lee	<i>Erindale College:</i> John Butler Walter Celej	<i>Music:</i> Jim Wells	<i>Scarborough College:</i> Rick Mewhinney David Fulford
<i>Business Certificate:</i> Betty Carter	<i>Forestry:</i> Neil Stewart	<i>New College:</i> Richard Sacks	<i>Social Work:</i> Sylvia Pivko
<i>Child Study:</i> Patricia McGee	<i>Graduate Studies:</i> Mark Johnson Helga Malloy	<i>Nursing:</i> Ann Ashby	<i>Speech Pathology:</i> Gillian Gailey
<i>Community Health:</i> Ted Best	<i>Household-Nutritional Science:</i> Phyllis Tanaka	<i>O.I.S.E.:</i> Elizabeth Jarvis	<i>University College:</i> James Joyce Jane Clarke June Surgey
<i>Dentistry:</i> Sidney Golden Andrew Andrews	<i>Innis College:</i> Robert Smidrovskis	<i>Pharmacy:</i> Judy Carter	<i>Victoria College:</i> Jean McDonald Glenn Munro Ted Jarvis Larry Davies
<i>Education:</i> Bob Crowe	<i>Law:</i> Douglas Cannon	<i>Physical and Health Education:</i> Murray McCarthy	<i>Woodsworth College:</i> Norma Brock Chake Tchilinguirian
<i>Engineering:</i> Ted Gerson Blake Goodings Malcolm McGrath	<i>Library & Information Science:</i> Adele Ashby	<i>Physical and Occupational Therapy:</i> Peggy Mador	<i>T-Holders' Association:</i> John Maynard
	<i>Management Studies:</i> Benita Pries	<i>St. Michael's College:</i> John Kelly Maureen Pappin Donald O'Shea	

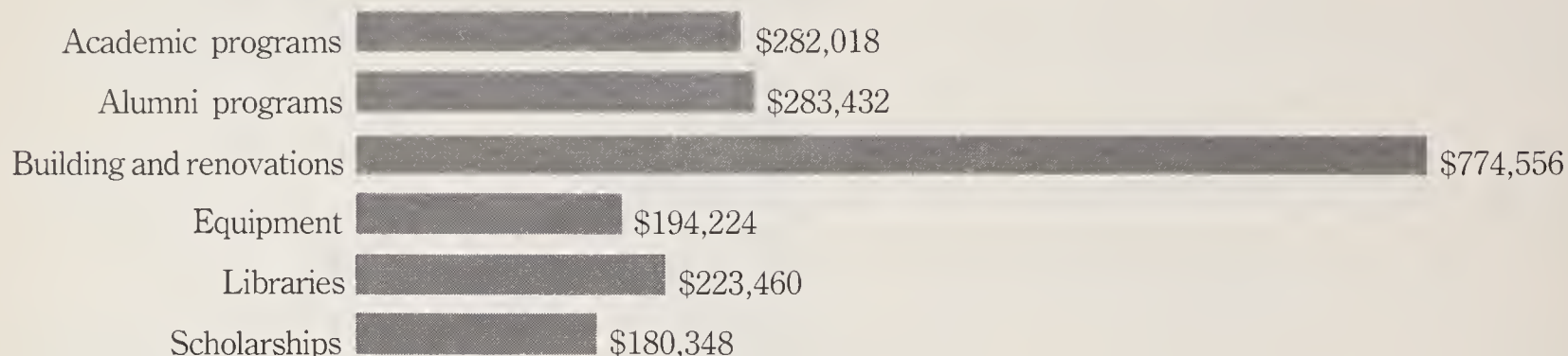
REPORT BY ALUMNI CONSTITUENCY

Constituency	No. of Good Addresses	No. of Donors	% Parti- cipation	Amount \$	Average Gift \$
Architecture and Landscape Architecture	1,385	153	11.1	7,395	48.33
Business Certificate	1,167	225	19.3	8,405	37.36
Child Study	724	59	8.2	1,732	29.36
Community Health	1,326	65	4.9	2,720	41.85
Dentistry	5,461	1,087	19.9	494,111	454.56
Education	16,264	357	2.2	12,183	34.13
Engineering	17,694	2,982	16.9	323,785	108.58
Erindale College	6,127	541	8.8	18,047	33.36
Forestry	1,307	267	20.4	19,968	74.79
Graduate Studies	10,642	803	7.6	46,388	57.77
Household-Nutritional Science	1,700	248	14.6	10,615	42.80
Innis College	1,403	194	13.8	11,137	57.41
Law	3,119	245	7.9	16,516	67.41
Library and Information Science	2,806	270	9.6	10,689	39.59
Management Studies	2,223	435	19.6	20,638	47.44
Music	1,372	85	6.2	4,490	52.82
New College	4,548	229	5.0	8,210	35.85
Nursing	4,239	676	16.0	21,782	32.22
O.I.S.E.	9,311	302	3.2	10,278	34.03
Pharmacy	5,024	703	14.0	33,631	47.84
Physical and Health Education	1,927	150	7.8	5,603	37.35
Physical and Occupational Therapy	2,814	405	14.4	14,135	34.90
St. Michael's College	9,625	1,787	18.6	362,929	203.09
Scarborough College	6,541	303	4.6	9,608	31.71
Social Work	2,868	232	8.1	9,787	42.19
Speech Pathology	234	70	29.9	1,845	26.36
T-Holders' Association	—	343	—	100,243	292.25
University College	16,098	2,885	17.9	207,808	72.03
Victoria College	16,401	3,227	19.7	250,149	77.52
Woodsworth College	7,883	739	9.4	24,676	33.39

WHERE THE GIFTS GO

1984 contributions to the Varsity Fund supported a myriad of projects within the University's various colleges

and faculties. The graph indicates the extent to which the general areas listed benefitted from the Fund.



MATCHING GIFTS

Over 450 companies will match, dollar for dollar, gifts made by their employees to the University of Toronto.

Graduates who wish their gifts to be matched should take the initiative and contact their personnel offices for the conditions of their company plan. Information about

matching gift programs is available from the Department of Private Funding at 978-2171.

In 1984, the following 70 companies contributed a total of \$56,725 to the Varsity Fund through their matching gift programs.

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 Arthur Andersen & Co.
 Baxter Travenol Laboratories Inc.
 Bechtel Foundation of Canada
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 Boise Cascade Canada Limited
 Boyle Midway Limited
 The Bumper Foundation
 Campbell Soup Company Limited
 Canadian General Electric
 Celanese
 Chrysler Canada Limited
 The Continental Corp. Foundation
 The Consolidated Food Foundation
 Dekalb Foundation
 Digital Equipment of Canada Limited
 Dow Chemical of Canada Limited
 Envirotech Canada Limited
 Ethyl Canada Inc.
 The Excelsior Life Insurance Co.
 Fiberglas Canada Inc.
 Ford Motor Company of Canada Ltd.
 Gannett Foundation
 GATX Corporation
 General Foods Limited
 Genstar Corporation
 Grace Foundation
 Hartford Insurance Group Inc.
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 McDonnell Douglas Foundation
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 Xerox of Canada Limited

VARSLTY FUND LEADERS BY CONSTITUENCY

In dollars:

Dentistry Completion Campaign.....	\$494,111
St. Michael's College.....	362,929
Engineering.....	323,785
Victoria College.....	250,149
University College.....	207,808

In participation:

Speech Pathology.....	29.9%
Forestry.....	20.4%
Dentistry.....	19.9%
Victoria College.....	19.7%
Management Studies.....	19.6%

REPORT BY BRANCH

Branch	No. of Graduates	No. of Donors	Participation %	Amount \$
Ottawa	6,104	1,110	18.2	96,250
London	2,904	356	12.3	40,565
Windsor	2,260	271	12.0	40,382
Montreal	1,555	277	17.8	26,137
Calgary	1,513	222	14.7	21,804
Vancouver	2,568	198	7.7	17,253
Edmonton	941	90	9.6	13,455
Thunder Bay	754	94	12.5	11,380
New York	817	164	20.1	10,344
Rochester	277	41	14.8	10,046

THE ASSOCIATES

The Associates of the University of Toronto, Inc., based in New York City, was established in 1947 to enable graduates and friends to receive tax receipts valid in the United States for their gifts to the University. In 1984, the Associates, led by president William Palm (Eng. 3T3), raised \$154,082 for the University from 971 United States residents.

The Associates support a variety of worthwhile projects including the distinguished Bissell-Heyd Professorship in Canadian-American studies, important graduate fellowships and scholarships, the University of Toronto Press and the Debating Union.


A new tax treaty between Canada and the United States, effective January 1, 1985, allows alumni of Canadian universities and their families resident in the United States to receive tax relief for gifts made directly to their alma maters. Consequently, U of T alumni in the U.S. may now send their contributions directly to the Varsity Fund rather than through the Associates. The Associates will continue to receive gifts from corporations, foundations and friends of the University.

GREETINGS FROM THE PRESIDENT

It is a great pleasure, on my return to the University of Toronto, to congratulate all alumni on the success of the Varsity Fund in 1984. The dedication of the volunteers who devote their time and skills to the campaign and the generosity of the donors who respond so loyally are a source of great personal inspiration and encouragement.

The inauguration of the President's Fund last year, is, of course, of particular interest to me. I plan to use the \$47,000 donated in 1984 on two projects which will serve to enhance the quality of student life at the University. When the Koffler Student Services Centre opens later this year, alumni will be proud to know that the Varsity Fund made possible the attractive completion of the Centre's mall area, the focal point of the building. Arts and Science graduates will be pleased to learn that the much needed renovation and beautification of the lobby of Sidney Smith Hall will be funded by the Varsity Fund.

I want to take this opportunity to announce that gifts made to the President's Fund in 1985 will establish prestigious national scholarships. As Canada's premier University, we must enable first-class scholars from Prince Rupert to Bonavista to attend the University of Toronto. The Varsity Fund will make this possible.



George E. Connell

The Taddle Creek Society

With gratitude the University of Toronto proudly recognizes the more than 1850 alumni, faculty, staff and friends of the Taddle Creek Society. In 1984, the Society once again achieved a substantial increase in membership of 35 percent over last year.

If you were a donor of between \$300 to \$999 in the calendar year 1984 and were not one of the 160 to request anonymity, please notify the Taddle Creek Society should you find your name has been omitted.

A

Charlotte M. Abbott
Abraham Aberback
Marjorie Abrams
Gordon L. Adair
Eileen Z. Adamson
Marian F.K. Ade
Mary J. Affleck
Paul Aird
David B. Aitchison
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Ruth E. Alison
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IMPOSSIBLE TO SOLVE?

ON MAY 3, 1775, THE PARIS ACADEMY decided that it would no longer "receive nor examine any paper concerned with squaring the circle, trisecting the angle, duplicating the cube, and perpetual motion". The first three problems, inherited from the Greeks, then as now, brought forth upon the mathematical community a flood of erroneous "solutions". What the academicians did not realize was that for deep structural reasons uncovered the following century the problems are actually *impossible* to solve.

Consider the following; decide which are impossible and solve the rest.

(1) Find four numbers the sum of any three of which is a perfect square.

(2) A loyal Toronto graduate wishes to make a rectangular patio from 60 one-metre-square concrete slabs joined into 15 T-shaped clusters of four (Figure A), each T to be painted blue or white. How should the T's be laid?

(3) Place the numbers 1, 2 . . . 18, 19 in the cells in Figure B to form a "magic" hexagon in which the numbers in each row of adjacent cells (having a side in common) parallel to a side of the hexagon have the same sum.

(4) Invert a set of 13 glasses by a series of moves in which eight of the glasses are turned over simultaneously.

Readers are invited to send their discoveries to: Aftermath, The Graduate, Department of Communications, University of Toronto, Toronto, M5S 1A1.



Figure A.

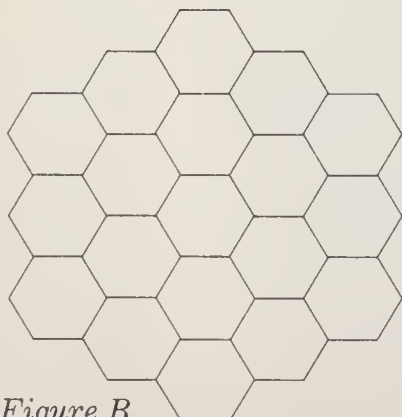


Figure B.

THE GRADUATE TEST NO. 31

THE WINNER OF THE Graduate Test No. 29 in the Jan./Feb. issue was Allyn Petrie Abbott of Mississauga. A copy of *Eldorado: Canada's National Uranium Company* by Robert Bothwell has been sent to her.

There were 305 entries. But, of these, 54 tripped over the pun in "Controlling the function of a reservoir, we hear". Which goes to prove that we have company in our imperfection because we had maintained that the number of entries had to be the same as the number of correct entries if the puzzle was completed because that was the only way it could be done.

On to better things. The U of T Press has generously provided, as the prize for Test No. 31, *The Man from Halifax: Sir John Thompson, Prime Minister* by Peter B. Waite, professor of history at Dalhousie University.

Entries must be post-marked on or before June 30. We will be able to announce the winner in the Sept./Oct. issue along with the winner of Test No. 30. After that, however, there will be a delay of one issue in the announcement of winners.

Address entries to: The Graduate Test, Department of Communications, University of Toronto, Toronto, M5S 1A1. And please don't forget to include your name and address.

Solution to The Graduate Test No. 30

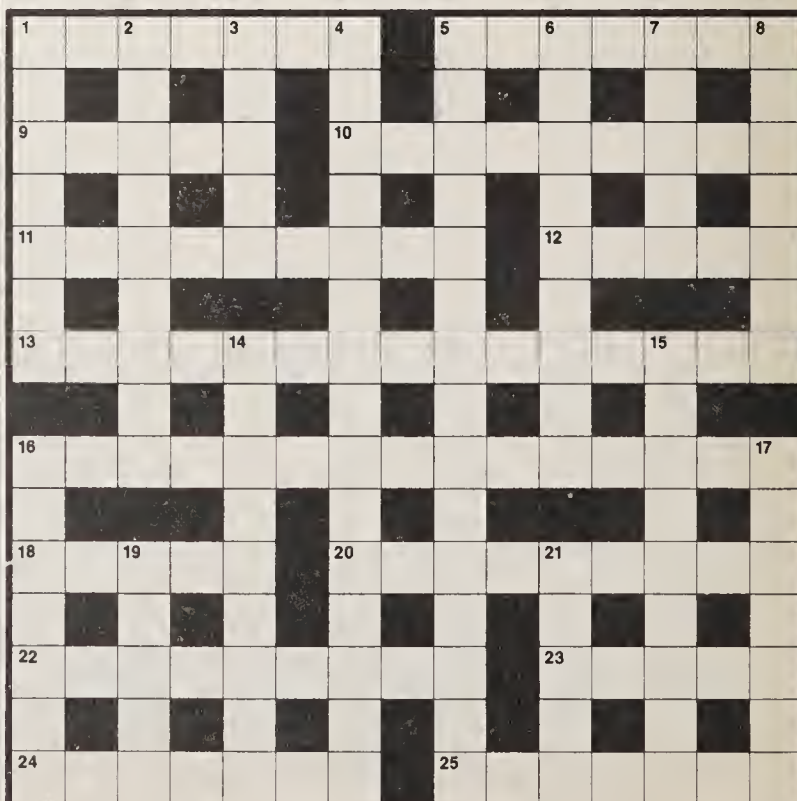
R	E	C	T	O	R	A	B	S	C	I	S	S	A
E	H	T	I	A	H	N	I	N	E				
H	E	A	T	H	E	L	E	O	N	I	N	E	
E	T	E	D	A	L	P	A						
A	F	T	E	R	N	O	O	N	E	M	P	T	
R	E			C	C	R	E	E					
S	A	L	T	O	F	T	H	E	E	A	R	T	H
E				R	O	I							
U	N	S	A	T	I	S	F	A	C	T	O	R	
C	A	T	N	T						V	S		
L	A	R	G	O		A	G	R	E	E	M	E	N
O	R	R	T	A	V	R	I						
S	W	A	H	I	L	I	O	R	A	S	T	I	C
E	T	O	O	E	O	L	A						
D	R	E	S	S	I	N	G	J	E	K	Y	L	L

ACROSS

1. Feeling a sense of guilt for a counterfeit edition (7)
5. Pete tumbled into pit through tube (7)
9. Map shows a hundred in front of U of T's house (5)
10. Lister's mixture is heart of procedure to kill germs (9)
11. Downtown singer starts new club, eager, but showing peevishness (9)
12. It helps things go smoothly for Gretzky? (5)
13. Parting shots cow us; we err wildly (4,5,6)
16. Instructor holding forth heartily uses Nos. deceptively but shows lack of reliability (15)
18. Irish terrorists with intelligence back one who fights Iran? (5)
20. CUEW members sell edition with tufted ornaments (9)
22. King feeding strangely with point of sharp thing (5-4)
23. Open mouth around point of peninsula (5)
24. With some strain about past, present or future? (7)
25. Wickedness employs air-filled cavities (7)

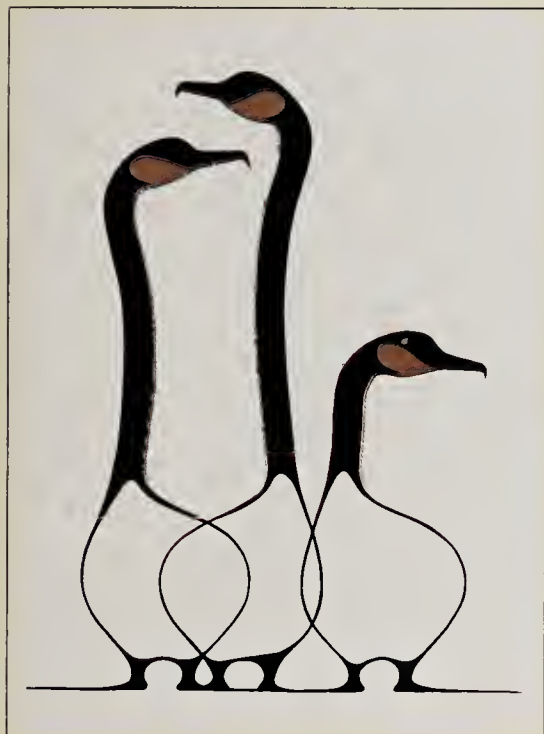
DOWN

1. Believes accounts about extended play (7)
2. The man with Arthur has pain or sorrow (9)
3. Could be silver for spot of tea during dinner? (9)
4. Showing no enthusiasm to dig up eastern way — led astray by yearning at first (15)
5. Exaggerated claims about shelter in godliness (15)
6. Toxic river is on us following nothing (9)
7. 'Tis going to weave (5)
8. It may be raised in question: Are you in old-fashioned get-up to quarrel? (7)
14. "Cease, girl, out with that profanity!" (9)
15. Pauses about wiggly line that joins up again (2-7)
16. Three Kent riots are a trifle (7)
17. No joy in a send up on board (7)
19. Place in order to gain, roughly, about fifty (5)
21. Old Governor-General tossed Nigel out (5)



Woodland Indian Artist Benjamin Chee Chee

Alumni Media is pleased to present 9 reproductions of works by the late Benjamin Chee Chee.
These are the only reproductions authorized by the artist's estate.



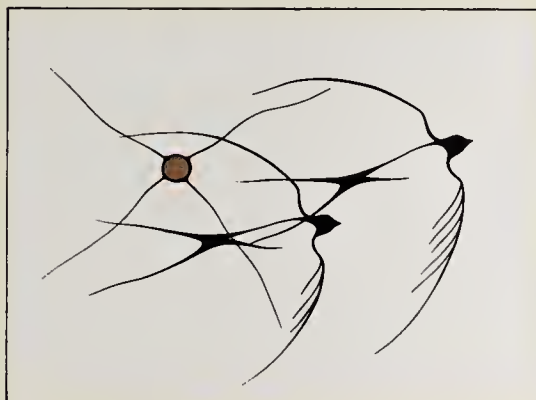
A Friends

A mainly self-taught artist, Chee Chee was a prominent member of the second generation of woodland Indian painters.

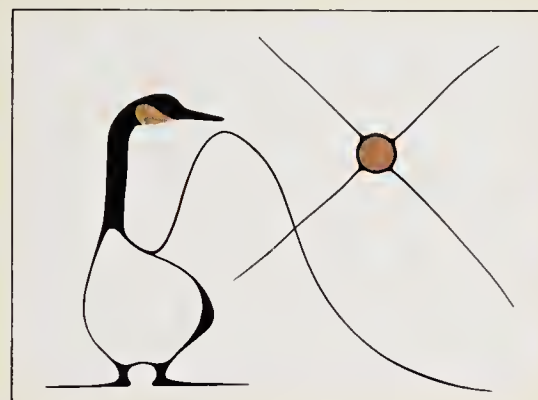
Unlike many of his contemporaries who employed direct and "primitive" means, Chee Chee's work was influenced by modern abstraction. His style reduced line and image in keeping with international modern art.

At the age of 32, at the height of his success, Chee Chee died tragically by suicide.

These reproductions are printed on high quality, textured stock and measure 48 cm x 61 cm (19" x 24").



B Swallows



C Good Morning



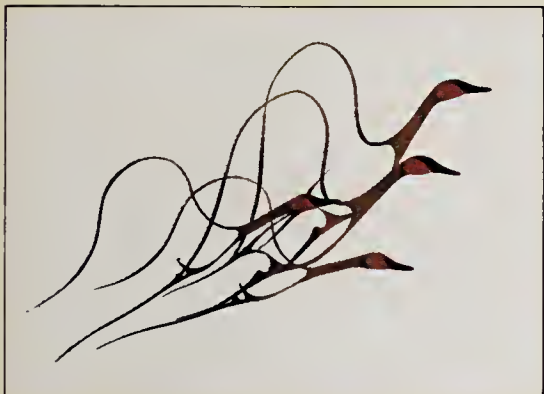
D Proud Male



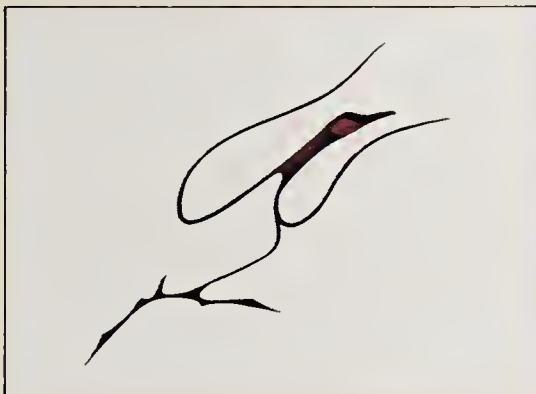
E Mother & Child



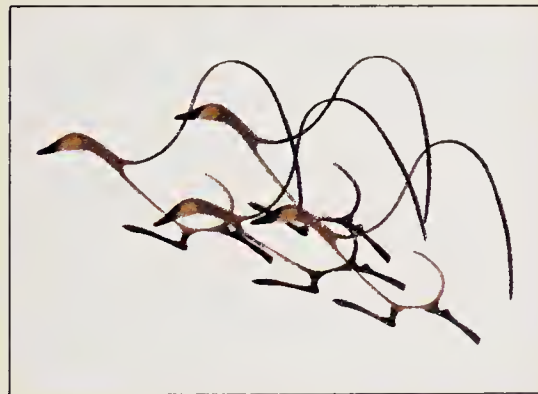
F Sun Bird



G Spring Flight



H Wait For Me



I Autumn Flight

Please send me the following Benjamin Chee Chee print reproductions at \$23.95 each or \$88.00 for any four, plus \$4.95 for handling and shipping (overseas: \$7.50). Ontario residents please add 7% sales tax to combined cost of print(s) plus shipping/handling.

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